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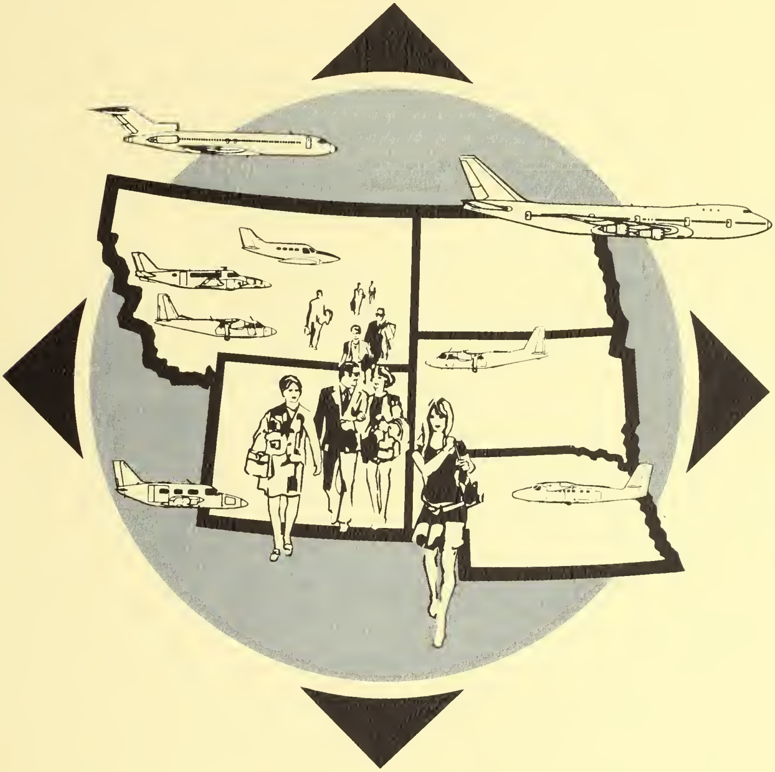
# OLD WEST REGION COMMUTER AIR SERVICE FEASIBILITY STUDY

# TECHNICAL REPORT

DECEMBER 1975



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**Old West Regional Commission**

by

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El Segundo, California

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# OLD WEST REGION COMMUTER AIR SERVICE FEASIBILITY STUDY

Technical Report

December 1975

Prepared for the

OLD WEST REGIONAL COMMISSION

by

THE AEROSPACE CORPORATION

El Segundo, California

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- THE PROBLEM
- A POSSIBLE SOLUTION
- COMMUTER AIR CARRIER BACKGROUND
- PRIOR STUDIES
- CURRENT STUDY AND PARTICIPANTS

# INTRODUCTION AND BACKGROUND

- The Problem

The states in the Old West Region (Montana, Nebraska, North Dakota, South Dakota, and Wyoming) share the problem of other Western states in having a number of small communities located large distances from the region's population centers. Because of these large distances, the lack of alternative ground transportation modes, and winter weather factors, air service is not only desired but often critically needed for business, medical, airline connection, shopping, and recreational travel purposes. As many of these communities are sparsely populated, it is not always feasible to fulfill this need with certificated local service or trunk airlines using relatively large aircraft.

(1) Service Frequency

The Old West Region is served by three certificated trunk airlines (Western Airlines, Inc., Northwest Airlines, Inc., and United Airlines) and three local service carriers (Frontier Airlines, Inc., North Central Airlines, Inc., and Hughes Airwest). Although these carriers serve over 50 communities within the region (principally using 50-passenger turboprop and 90- to 110-passenger jet aircraft(1)), there are over 90 communities in the region with populations over 2000 who currently receive no air service at all. Further, as relatively large aircraft are used, a number of the communities currently served receive less than two round trips per day to their principal community of travel interest.

(2) Aircraft Suitability

A potential problem that will affect air service to the region's smaller communities is the desire of the local service carriers to eventually phase out their older 50-passenger turboprop aircraft in favor of larger jet aircraft. Thus, even if a community's airport facilities can accommodate jet aircraft, significant patronage would be required to ensure economic viability for the airline. Even in view of current federal subsidies to local service airlines, some of the smaller communities may face a loss of air service.

---

(1) Frontier Airlines also currently uses 19-passenger turboprop aircraft to serve ten of the smaller communities in their system.

Current planning by the local service carriers operating 50-passenger turboprop aircraft in the region indicates two different phase-out approaches. Frontier Airlines is projecting use of their turboprop aircraft only through 1980 and have already stated their intent to file for service deletion at a number of smaller points served by these aircraft. They have also expressed a desire to discontinue service in markets currently being served by the 19-passenger Twin Otter. Although these actions are, of course, subject to the approval of the Civil Aeronautics Board (CAB), the indicated trend has motivated interest in the feasibility of alternative air service concepts in these markets.

North Central Airlines representatives have stated their intent to retain sufficient turboprop aircraft to serve their smaller markets through 1985 (subject to no major changes in the current federal subsidy program). At that time they are hoping an appropriate jet aircraft of 60- to 70-passenger capacity will be available. Although such an aircraft is under study by a number of agencies, no commitment has been made that would guarantee its availability in the required time period. Again, the examination of feasible air service alternatives is indicated.

### (3) Regulatory Reform

A further potential problem related to service to small communities is the ultimate impact of regulatory reform. The Administration, Congress, and the CAB are currently investigating methods of streamlining the current regulatory procedures pertaining to certificated air carriers as well as relaxing current restrictions on market entry/exit and fares. Although any conclusions on the impact of service to smaller communities must necessarily await decisions on the final form such regulatory reform might take, a number of airline representatives and associations have expressed their concern over the feasibility of continued service to smaller markets in such an environment.

- A Possible Solution

One answer to these problems has been the implementation of scheduled air service by commuter airlines. These airlines, operating reliable twin-engine aircraft, can economically serve many small communities at a service frequency much higher than would be feasible for a certificated air carrier operating larger aircraft. In recent years such carriers have proven themselves to be a significant part of the national transportation system, particularly in service to small communities. In FY 1974, for example, 222 scheduled commuter operators served 725 airports, carrying 6.3 million passengers and 131,000 tons of cargo and mail. Almost 60 percent of the communities served had populations of less than 50,000.

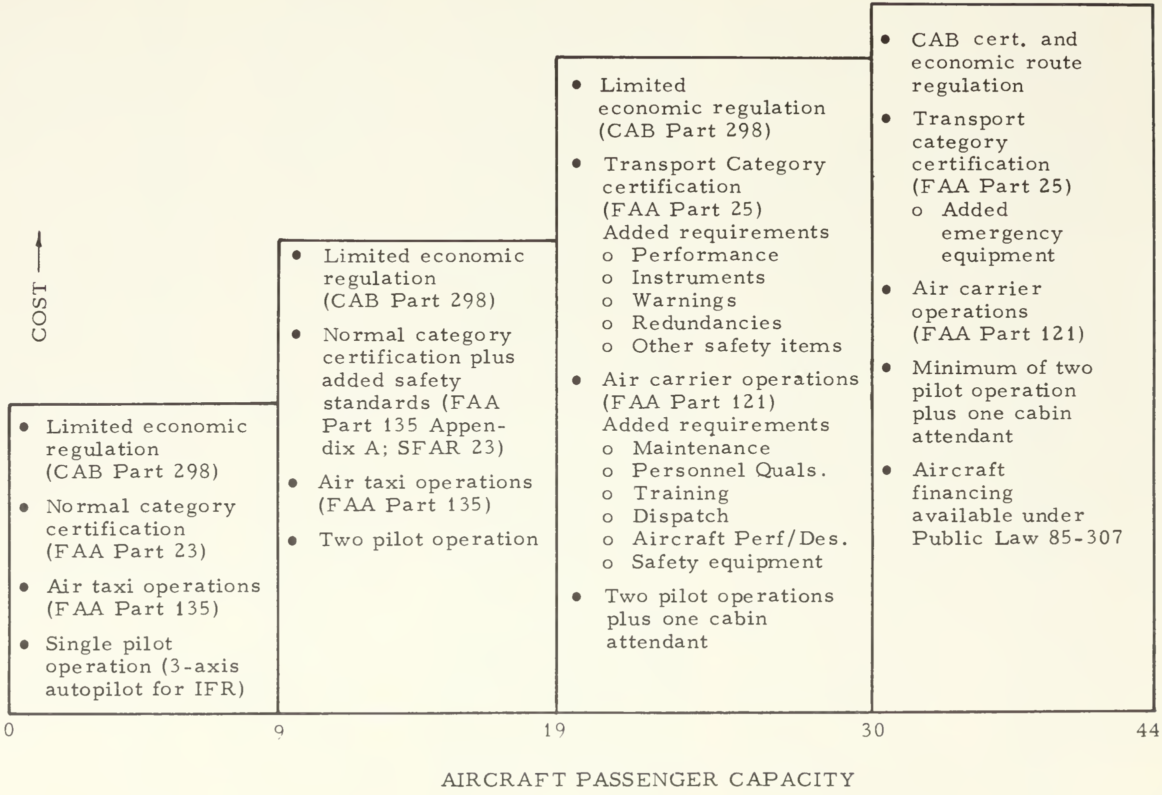
- Commuter Air Carrier Background

Commuter air carriers are those carriers normally operating 5- to 30-passenger aircraft who, in accordance with published schedules, perform a minimum of five round trips a week between two or more points or who have mail contracts with the U.S. Postal Service. The CAB has provided blanket authorization for all commuter air carriers to operate pursuant to Part 298 of its Economic Regulations. Providing they operate aircraft carrying 30 passengers or less, or have 7500 pounds of payload capacity or less (empty weight less than 35,000 pounds), such carriers are exempt from the CAB regulatory requirements imposed on the trunk and local service carriers. Trunk and local service carriers must obtain certificates of public convenience and necessity from the CAB and are subject to CAB regulation and approval of routes, tariffs, airline agreements, etc.; monitoring of on-time performance; and requirements for specific traffic and economic reporting. Currently, commuter air carriers are only required to report selected traffic statistics to the CAB on a quarterly basis and to carry certain insurance minimums. Traffic statistics of commuter air carriers are not released publicly for one year after receipt to protect the carriers' competitive position. Such carriers are free to operate over any routes of their choosing and charge any fares they wish provided they are operating in a state that, in turn, does not regulate commuter air carriers. Some 25 states (including the five states in the Old West Region), however, currently regulate or are authorized to regulate commuter air carrier operations within their states. Such regulation is usually administered by the states' Aeronautics Department or Division or their Public Service Commission and typically will include route certification, tariff filings, requirements to report operating and economic statistics, and requirements for a certain minimum level of insurance.

Commuter aircraft and operators are also regulated by the Federal Aviation Administration (FAA). All carriers are subject to Federal Aviation

Regulations (FAR) Part 91, which contains general operating rules for all aircraft. Air carriers operating large aircraft (i.e., over 12,500 pounds gross weight) are also required to operate in accordance with FAR Part 121. This regulation imposes requirements related to aircraft maintenance, management personnel and crew qualifications, training, dispatching, and safety equipment. Commuter air carrier operators, who typically operate smaller aircraft, are permitted to operate under FAR Part 135, which is less detailed than Part 121. Other FAA regulations affecting commuter air carriers are FAR Parts 23 and 25. These regulations pertain to certification of aircraft with Part 23 pertaining to the normal-category smaller aircraft and Part 25 pertaining to larger transport-category aircraft. Currently, any aircraft with a capacity of ten passengers or more must be certificated to the more stringent requirements of Part 25. Table I summarizes, in a general sense, these regulatory requirements as related to cost and aircraft capacity.

## TABLE I. IMPACT OF AIR CARRIER REGULATIONS ON COST



- Limited economic regulation (CAB Part 298)
- Normal category certification (FAA Part 23)
- Air taxi operations (FAA Part 135)
- Single pilot operation (3-axis autopilot for IFR)

- Limited economic regulation (CAB Part 298)
- Normal category certification plus added safety standards (FAA Part 135 Appendix A; SFAR 23)
- Air taxi operations (FAA Part 135)
- Two pilot operation

- Limited economic regulation (CAB Part 298)
- Transport Category certification (FAA Part 25) Added requirements
  - o Performance
  - o Instruments
  - o Warnings
  - o Redundancies
  - o Other safety items
- Air carrier operations (FAA Part 121) Added requirements
  - o Maintenance
  - o Personnel Quals.
  - o Training
  - o Dispatch
  - o Aircraft Perf/Des.
  - o Safety equipment
- Two pilot operations plus one cabin attendant

- CAB cert. and economic route regulation
- Transport category certification (FAA Part 25)
  - o Added emergency equipment
- Air carrier operations (FAA Part 121)
- Minimum of two pilot operation plus one cabin attendant
- Aircraft financing available under Public Law 85-307

- **Prior Studies**

Three prior aviation studies in the Old West Region influenced the need for, and contributed to, this Old West Region Commuter Air Service Feasibility Study.

The first was an "Old West Regional Airport Study," September 1974, sponsored by the Old West Regional Commission. This study examined the economic and financial feasibility of an Old West Regional Airport. One of the findings of this study indicated the need for the examination of a regional commuter system to provide, as appropriate, feeder service based upon travel demand within the region.

A second study was a 1973 "Air Transportation Requirements Study" in the State of Nebraska sponsored by the Nebraska Department of Aeronautics. This study investigated the feasibility of improving the availability of public transportation to selected Nebraska communities through the provision of, or the improvement of, air transportation service. One finding of this study encouraged further study of enlarging potential air transportation markets by providing service to groups of cities on a regional basis rather than service to individual cities.

Finally, in 1974 the Wyoming Department of Economic Planning and Development sponsored "A Study of the Economic Feasibility of Providing Third Level Air Carrier Service in Wyoming." This study investigated the feasibility of commuter air service in Wyoming from both an inter- and intrastate standpoint.

Each of the above three projects provided valuable background and inputs to this study.

- **Current Study and Participants**

In view of the above-mentioned problems and studies, the Old West Regional Commission (OWRC) sponsored the current commuter project designed to "examine the technical and economic feasibility of a commuter air system satisfying the needs for improved or new air service in the Old West Region." The study addressed the service needs of the region; investigated alternative air service strategies to meet these needs best; projected commuter air service patronage in 1976 and 1985; defined route structures, aircraft, service characteristics, and attendant economics of operation; assessed airport adequacy; evaluated financing needs and funding sources; and examined alternative implementation options.

The study was conducted by The Aerospace Corporation, El Segundo, California, under the direction of the Old West Regional Commission Project Director, Mr. Robert P. DeMersseman. Policy guidance was provided by the governors of the five states in the region, their alternates, and the Old West Regional Commission Federal Co-Chairman, Warren C. Wood. Technical inputs and guidance were provided by the aeronautics officials and staffs of the various state aeronautics departments, divisions, and commissions. Figure 1 shows a simplified representation of the study organization.

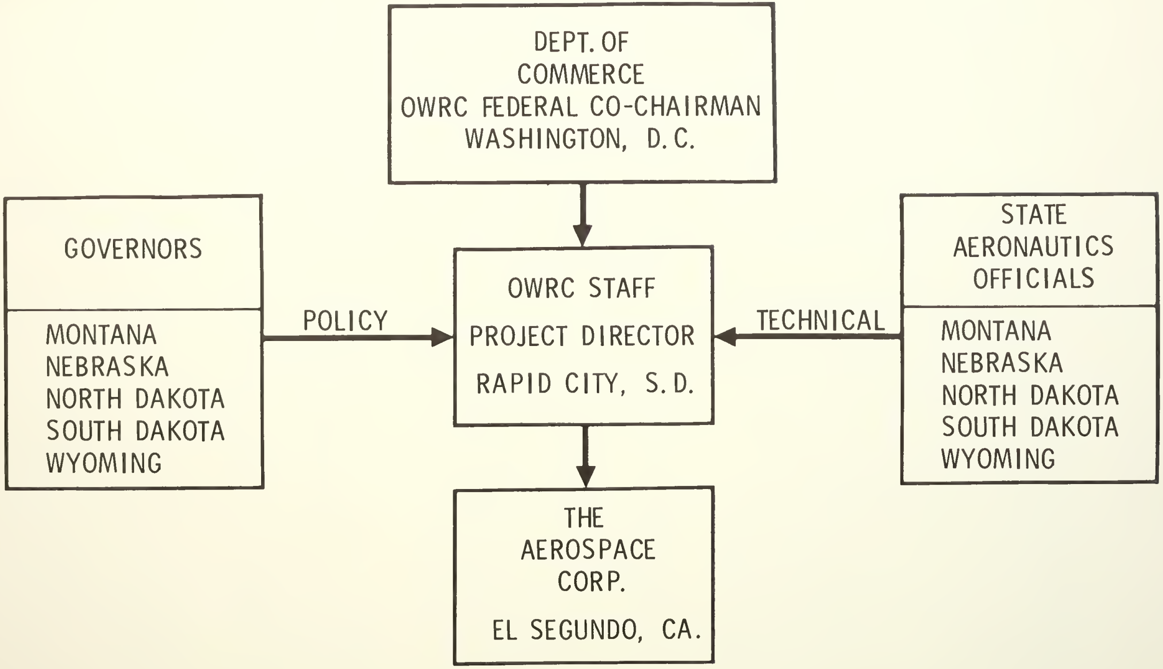


Figure 1. Old West Regional Commission (OWRC) Commuter Air Service Study Organization

- GOAL
- OBJECTIVES

# STUDY GOAL AND OBJECTIVES

- Goal

The study goal was to evaluate the technical and economic feasibility of a commuter air system satisfying the needs for improved or new air service in the Old West Region in the 1976 and 1985 time periods.

- Objectives

Specific study objectives included the following:

- o Determination of the feasibility of commuter air carrier service to provide new service where needed and to replace certificated air carrier service where minimal service levels currently exist.
- o Determination of the feasibility of commuter air carriers replacing certificated air carrier service in markets currently employing older turboprop aircraft and in which the certificated air carriers do not envision demand levels sufficient to be served by pure jet aircraft.
- o Evaluation of the feasibility of a regional collector airport concept wherein commuter air carriers would provide feeder service to collector points served by certificated air carriers.
- o Comparison of the economics of commuter air carrier service in place of currently subsidized certificated air carrier markets within the region.
- o Evaluation of options for implementing the most promising commuter air service system.

- CURRENT AIR SERVICE
- AIR TRAVEL PATTERNS

# SERVICE NEEDS AND CRITERIA

- Current Air Service

One of the initial steps in establishing the need for new or improved service in the Old West Region was to identify the nature of the current air service being provided. In order to establish a common service baseline, the air service in existence as of May 1, 1975, was defined as shown in Figure 2 (Ref. 1). This service was further categorized as to type and frequency on individual routes and route segments as follows:

- Two or more round trips per day using pure jet aircraft
- Two or more round trips per day using turboprop aircraft
- Turboprop aircraft or less than two round trips per day, or both
- Current commuter air carrier service

These service categories were used to identify routes and route segments that, in general,

- Have adequate air service
- May be candidates for possible future replacement service by commuter air carriers should turboprop aircraft be phased out
- May be considered for immediate replacement service by commuter air carriers based on current certificated service providing less than two round trips per day to principal communities of travel interest

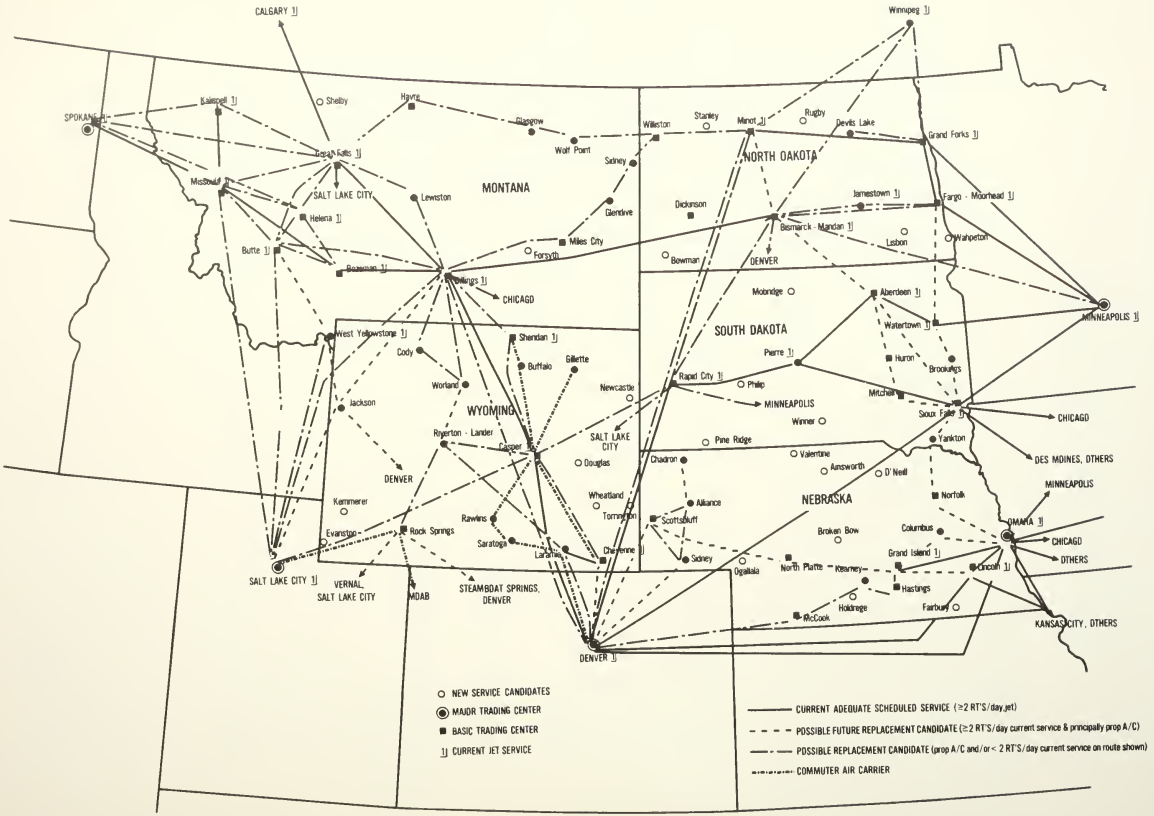


Figure 2. Current Air Service in Old West Region (5/1/75)

- Are currently adequately served by commuter air carriers

Although these criteria were not considered to be absolute in determining current air service improvement need, they were used as one major guideline.

Currently unserved communities that were candidates for new air service were established in a different manner. Initially, criteria was established as depicted in Table II and coordinated with the respective state aeronautics officials, representatives of planning organizations, and other interested parties identified in Table III. New service eligibility criteria included consideration of population, isolation, special activity centers, and a special "designated" category to account for economic development priorities, medical isolation, community interest, and other local factors. As a result 17 new service candidates were identified for further study and are identified in Figure 2 with an open circle code. It should be noted that discussions with the individuals and organizations listed in Table III included other factors that influence air service implementation, including principal communities of travel interest, demographic features of the communities and region, current and prior travel patterns and volumes, available transportation modes, future plans, and development priorities.

## TABLE II. OLD WEST REGION CRITERIA TO ESTABLISH ELIGIBILITY OF CURRENTLY UNSERVED COMMUNITIES FOR AIR SERVICE CONSIDERATION

### Population

Communities with service areas of 5,000 population or more. Service area is defined as the area contained within an approximate thirty-minute driving time of a community airport. This area would be adjusted in very low density areas to accommodate larger areas if no alternative is available.

### Isolation

Communities more than one hour's driving time from current, adequate scheduled (certificated or commuter) service. Adequate service is defined as no less than two round trips per day to the principal community of travel interest and spaced in a manner to offer travelers (1) early morning flight choices to their community of principal travel interest and a late afternoon or early evening return, and (2) relative convenience in connecting with flights to principal markets of interest outside the region.

### Special Activity Centers

Communities, regardless of population, which currently (or are projected to) generate or receive significant travel by virtue of recreational, mining, industrial, military, and educational interests.

### Designated Communities

Communities identified by the respective state aeronautics officials as candidates for air service because of designation as an economic development area, lack of readily available medical facilities, or other local factors.

## TABLE III. OLD WEST REGION AIR SERVICE STUDY COORDINATION MEETINGS AND CONTACTS

| State/Agency | Persons Contacted | Organization | Date |
|---|---|---|---|
| Montana | W. Hunt | Division of Aeronautics | 4-29-75 |
| | D. Kneedler | Division of Aeronautics | 4-29-75 |
| | T. Dundas | Research and Information Systems Division | 4-29-75 |
| | P. Devine | Highway Department Planning Bureau | 4-29-75 |
| | T. Mattison | Billings Chamber of Commerce | 4-30-75 |
| | J. Lawson | Billings Chamber of Commerce | 4-30-75 |
| Nebraska | R. Peralez | Department of Aeronautics | 4-17-75 |
| | J. Auer | Department of Aeronautics | 4-17-75 |
| | W. Kreuscher | Department of Aeronautics | 4-17-75 |
| | A. Fiola | Nebraska Public Service Commission | 4-17-75 |
| | C. Nutter | Nebraska Department of Roads | 4-17-75 |
| | J. Vohl | Nebraska Department of Roads | 4-17-75 |
| North Dakota | H. Vavra | Aeronautics Commission | 4-8-75 |
| | B. Austin | State Planning | 4-8-75 |
| | E. Gajeski | State Planning | 4-8-75 |
| | G. Barreth | Department of Highways | 4-22-75 |
| South Dakota | M. Schneider | Division of Aeronautics | 4-23-75 |
| | D. Kraus | Division of Aeronautics | 4-23-75 |
| | W. Voss | South Dakota Department of Transportation | 4-23-75 |
| | L. Schoenhard | South Dakota Department of Transportation | 4-23-75 |
| | D. Lamberty | State Planning Bureau | 4-23-75 |
| | R. Wagner | Rural Sociology Department SDSU | 4-29-75 |
| | H. Dean | Western S.D. Development Co. | 4-22-75 |
| Wyoming | C. Krauser | Aeronautics Commission | 4-24-75 |
| | J. Erstgaard | Economic Planning and Development | 4-24-75 |
| | J. Noblitt | Consultant | 4-24-75 |
| | A. Urich | Highway Department | 4-23-75 |
| Frontier Airlines | D. Love | Vice President, Future Planning | 4-25-75 |
| | H. Dean | Member, Board of Directors | 4-22-75 |
| North Central Airlines | D. Drumm | Manager, Public Relations | 5-1-75 |
| | D. Moran | Vice President, Traffic and Sales | 10-21-75 |
| | J. Harty | Staff Assistant | 10-21-75 |
| North West Airlines | R. Erickson | Vice President, Public Relations | 5-2-75 |
| Western Airlines | H. Earley | Director, Public Affairs | 4-25-75 |
| | J. Woolley | Director, Public Affairs | 4-25-75 |
| Hughes Airwest | J. Sparhawk | Special Assistant, Public Affairs | 5-22-75 |

- Air Travel Patterns

In order to supplement these discussions, desired cities of travel interest for currently served communities as well as new service candidates were investigated. For communities with a prior history of air travel, the primary markets of interest and travel volume were determined from available CAB Origin and Destination data (Ref. 2). Figures 3 through 6 identify and categorize, by yearly air travel demand, these city-pair markets. As expected, the major air travel markets originate in the larger cities in the region and terminate in Denver, Minneapolis, Omaha, and Salt Lake City (Figure 3). Lesser volume markets (Figure 4) indicate the same trend from the medium-size communities in the region to additional cities outside the region (e.g., Spokane, Kansas City, Los Angeles, and Chicago). Also a number of relatively high-volume intra-regional markets are evident (e.g., Casper-Billings, Rapid City-Omaha, Rapid City-Pierre, Pierre-Sioux Falls, and North Platte-Omaha). Low-volume markets (Figures 5 and 6) begin to indicate more of an intra-regional travel trend between major cities in the region but still show decided attraction to Denver, Salt Lake City, Minneapolis, etc. Although travel volume data are not readily available from the CAB, there is also a decided attraction from northern Montana and North Dakota to the Canadian cities of Calgary and Winnipeg. Western and Frontier are currently serving these points.

In order to assist in determining the principal cities of travel interest for communities with no prior air travel history, Rand McNally trading patterns were reviewed (Ref. 3). These patterns are divided into major and basic trading centers and attendant areas of influence based upon detailed assessments of such factors as shopping patterns, cultural and economic ties, accessibility, and newspaper circulation. The resulting trading centers and areas for the Old West Region are shown in Figure 7. Although not absolute indicators of travel desire, these trading area provide additional information in establishing transportation trends.

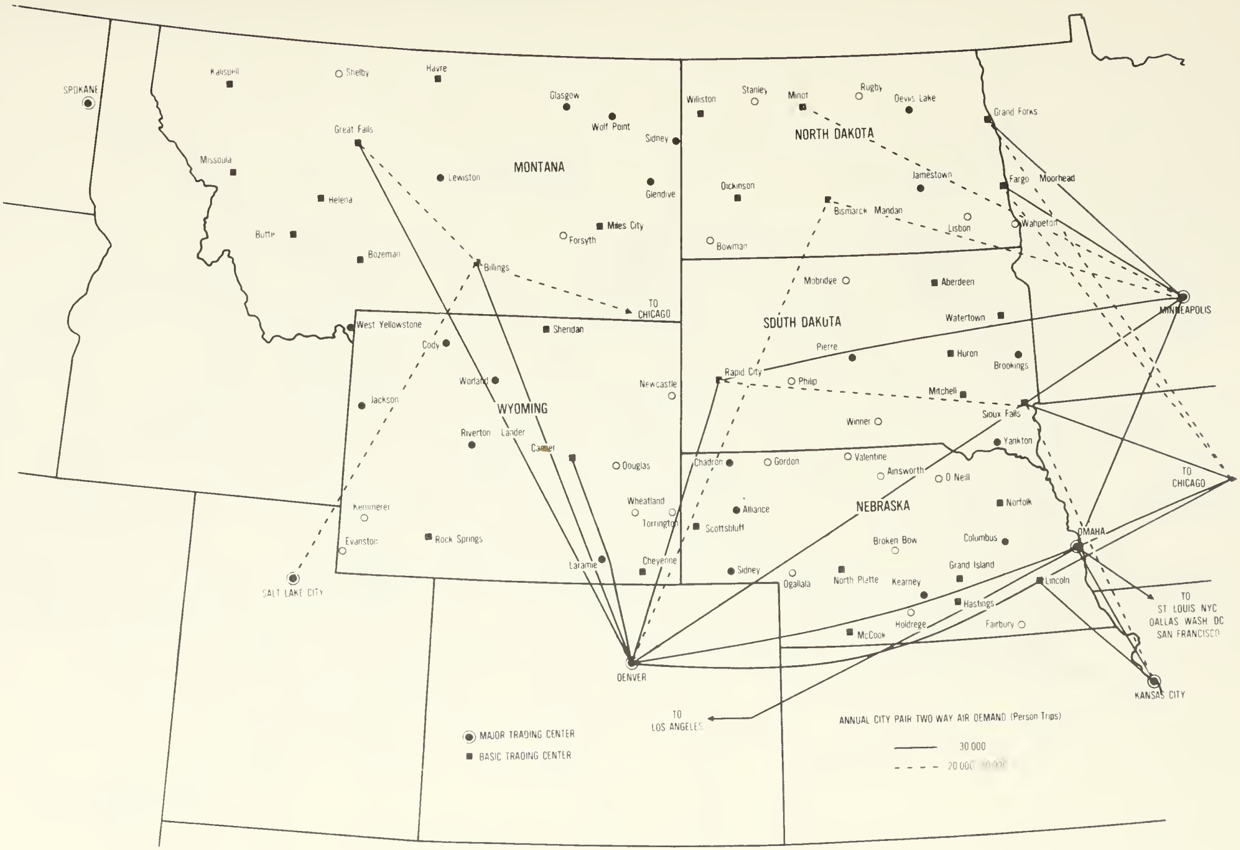


Figure 3. Major City-Pair Certificated Air Service Markets--20,000 to 30,000+ Annual Passengers (1973)

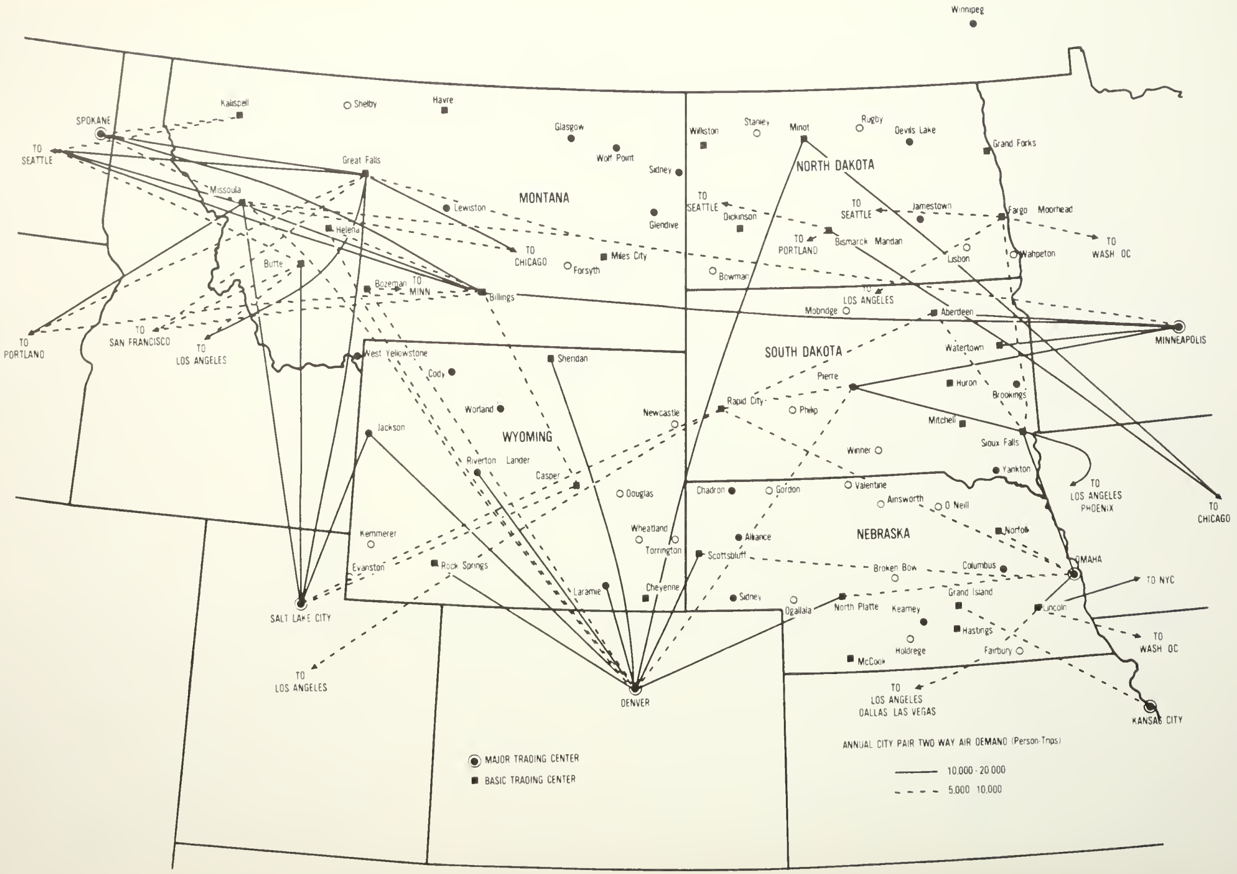


Figure 4. Major City-Pair Certificated Air Service Markets--5,000 to 20,000 Annual Passengers (1973)

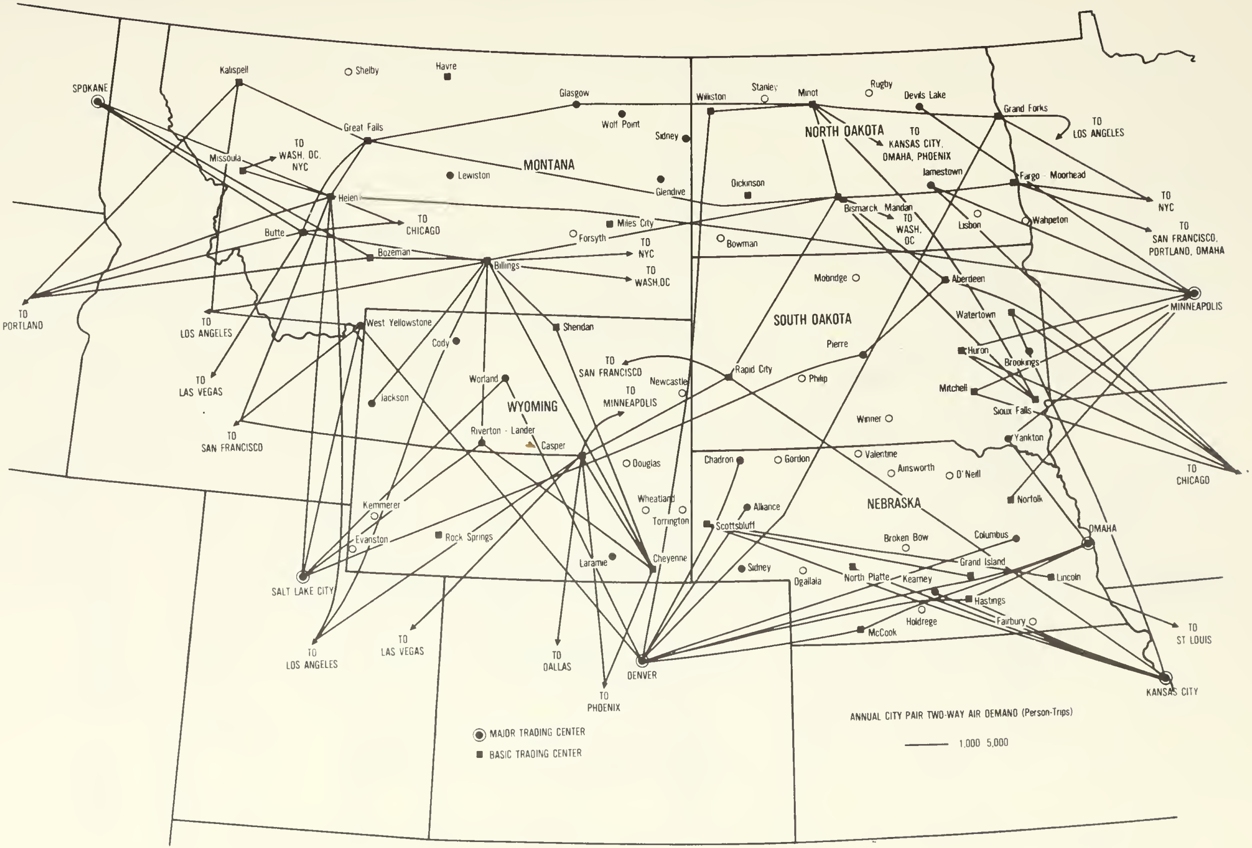


Figure 5. Major City-Pair Certificated Air Service Markets--1,000 to 5,000 Annual Passengers (1973)

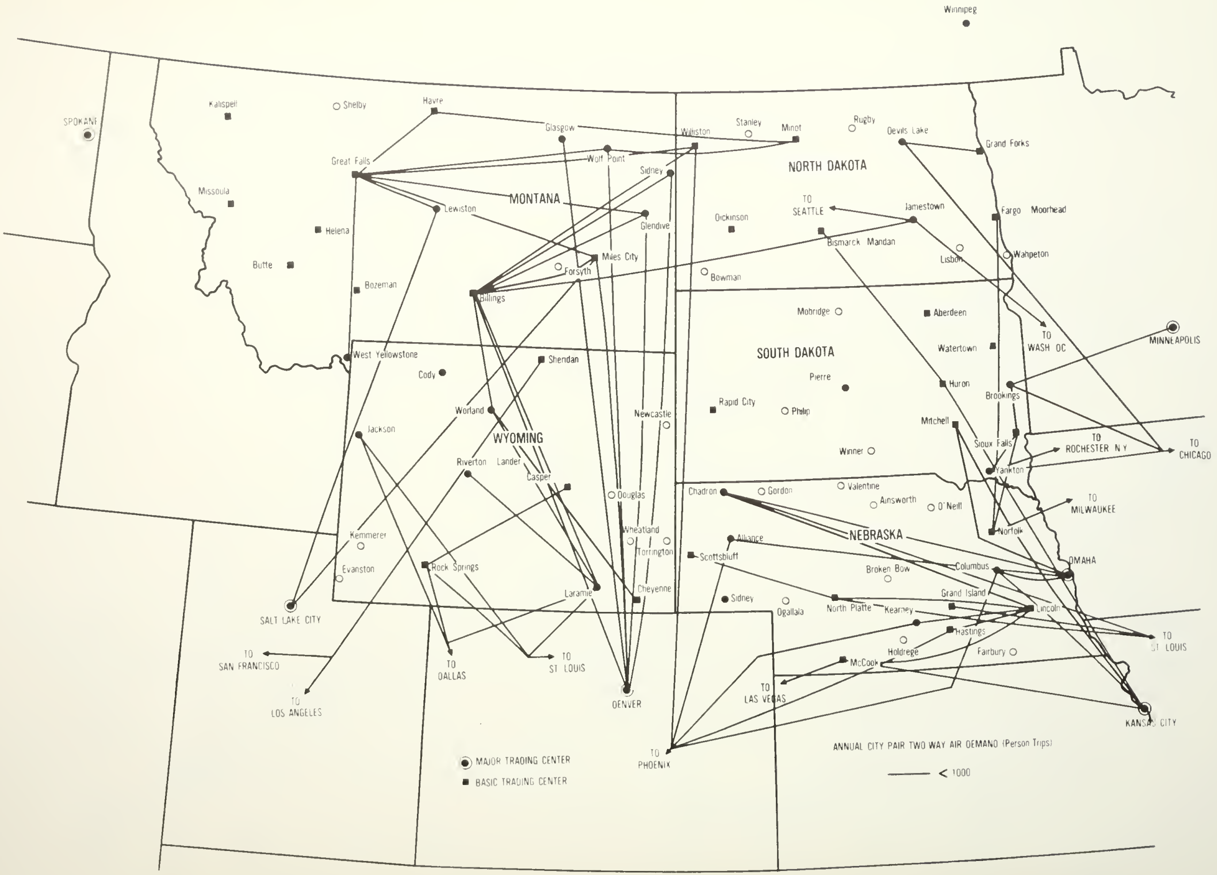


Figure 6. Major City-Pair Certificated Air Service Markets--Less Than 1,000 Annual Passengers (1973)

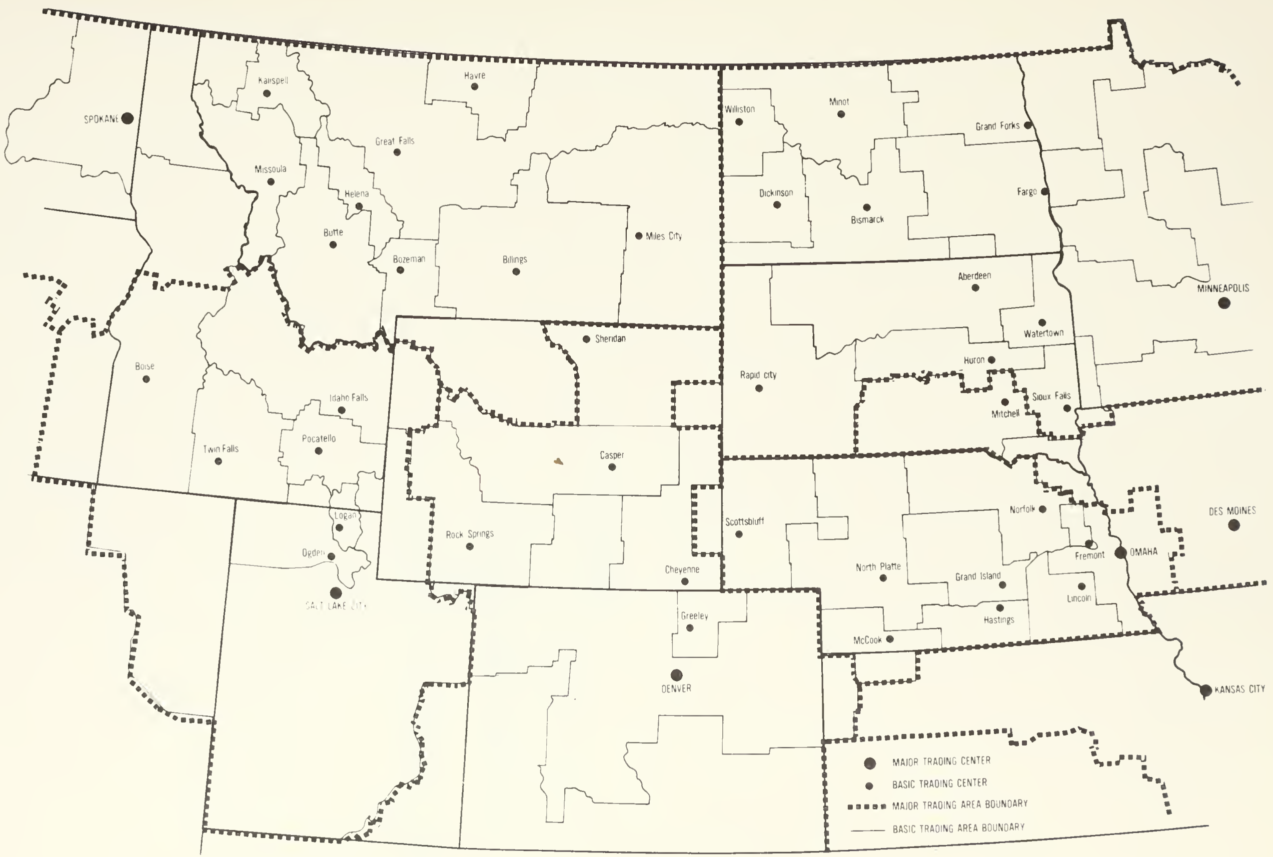


Figure 7. Old West Region Trading Areas

- GENERAL
- BASIC NETWORK CONCEPT
- SUBREGIONAL COLLECTOR CONCEPT
- REGIONAL COLLECTOR CONCEPT

# ALTERNATIVE AIR SERVICE STRATEGIES

- General

Three primary alternative air service strategies were examined for feasibility in view of the improved and new air service needs and the specific study objectives as discussed in the previous sections. These alternatives included the following:

- A Basic Network Concept designed as a readily implementable system that provides new service where needed and replaces current certificated air service only where older turboprop aircraft are employed or certain minimum service levels are not provided
- A Subregional Collector Concept designed to explore an implementable commuter system feeding a number of regional collector points that would, in turn, be interconnected by certificated air service
- A Regional Collector Concept designed to provide an extensive commuter system feeding a limited number of regional collector points that would be interconnected by certificated air service

(A fourth alternative, a commuter air service network to provide replacement service in current subsidized local service airline markets was also investigated and is discussed in the "Local Service Airline Subsidy Analysis" section of this report.)

- Basic Network Concept

Table IV identifies the basic ground rules for defining the Basic Network Concept. The resulting commuter air service network and its attendant impact on the current certificated air service system are shown in Figures 8 and 9, respectively.

The commuter network in Figure 8 provides for a minimum of two round trips per day between new service candidates meeting the eligibility criteria of Table IV and their principal communities of travel interest. The network further assumes commuter replacement service to currently served markets that are not receiving two or more round trips per day or that are currently served by prop-jet aircraft and are not anticipated by the serving airline as having jet potential at this time. (Jet potential in this sense means adequate airport facilities for 90-passenger jet aircraft, appropriate projected numbers of passengers to provide a reasonable route load factor, and sufficiently long air distances between cities served to facilitate economic jet operation--usually greater than 50 miles.)

As shown in Figure 9, a few routes that are currently served by jet aircraft were assumed to be replaced by commuter air service as current service levels were less than one round trip per day. These were Spokane-Kalispell-Great Falls; Rapid City-Casper-Salt Lake City; Casper-Sheridan-Billings; and Bismarck-Rapid City. Although traffic levels at this time do not justify adequate jet aircraft service levels, it is expected that the current certificated carriers would not readily agree to replacement service on these routes. They were still investigated, however, to obtain comparative data if, in fact, certificated service changes did occur in the near future. The detailed results of the analysis of the concept on route-by-route basis are presented in Appendix 1.

## TABLE IV. BASIC NETWORK CONCEPT GROUND RULES

Community Eligibility for New or Improved Air Service Consideration

- Currently Served (May 1975)

  Less than two convenient round trips per day to principal community(ies) of interest (any aircraft)

  All communities currently served by prop-jet aircraft that the airlines do not anticipate having jet potential

- Currently Unserved

  Service area population of 5000 or more and

  More than one hour's driving time from adequate scheduled air service or

  Designated as eligible by state aeronautics officials

Commuter Service Strategy

- Minimum of Two Round Trips per Day to Nearest Basic Trading Center and/or Nearest Adequate Scheduled Air Service
- No Attempt to Change Service Points of Currently Served Communities

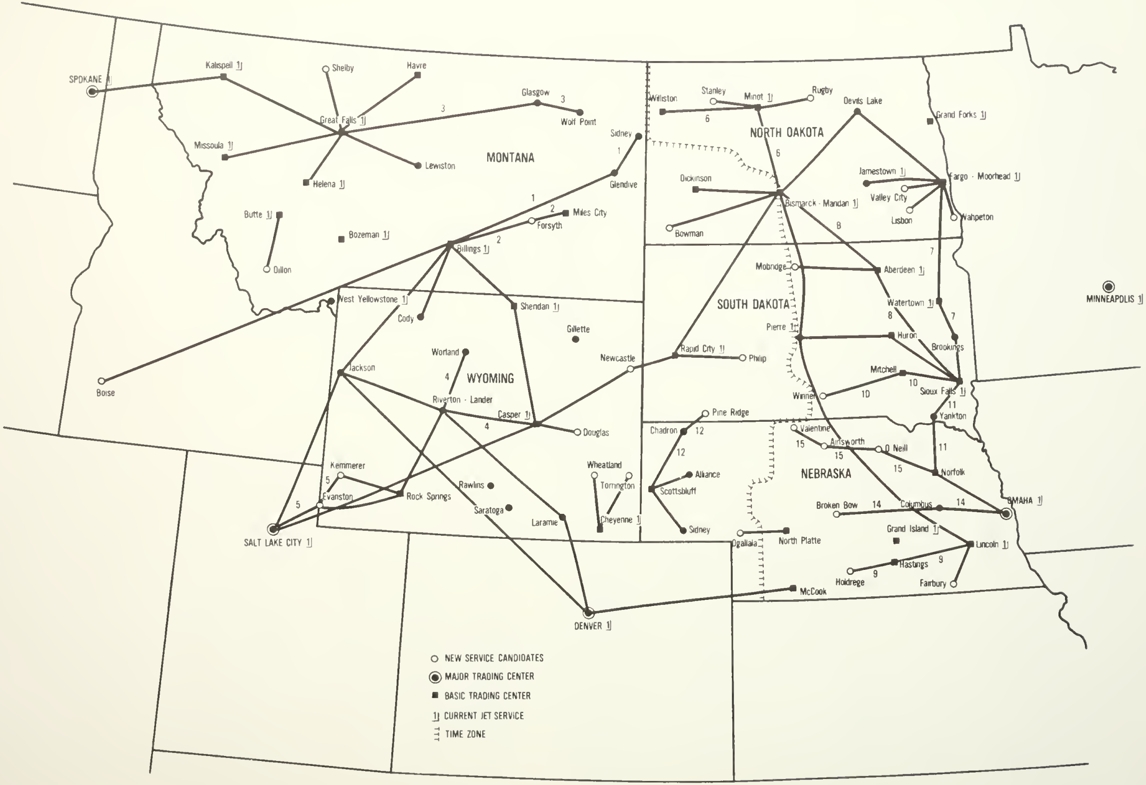


Figure 8. Basic Network Concept--Commuter Air Service

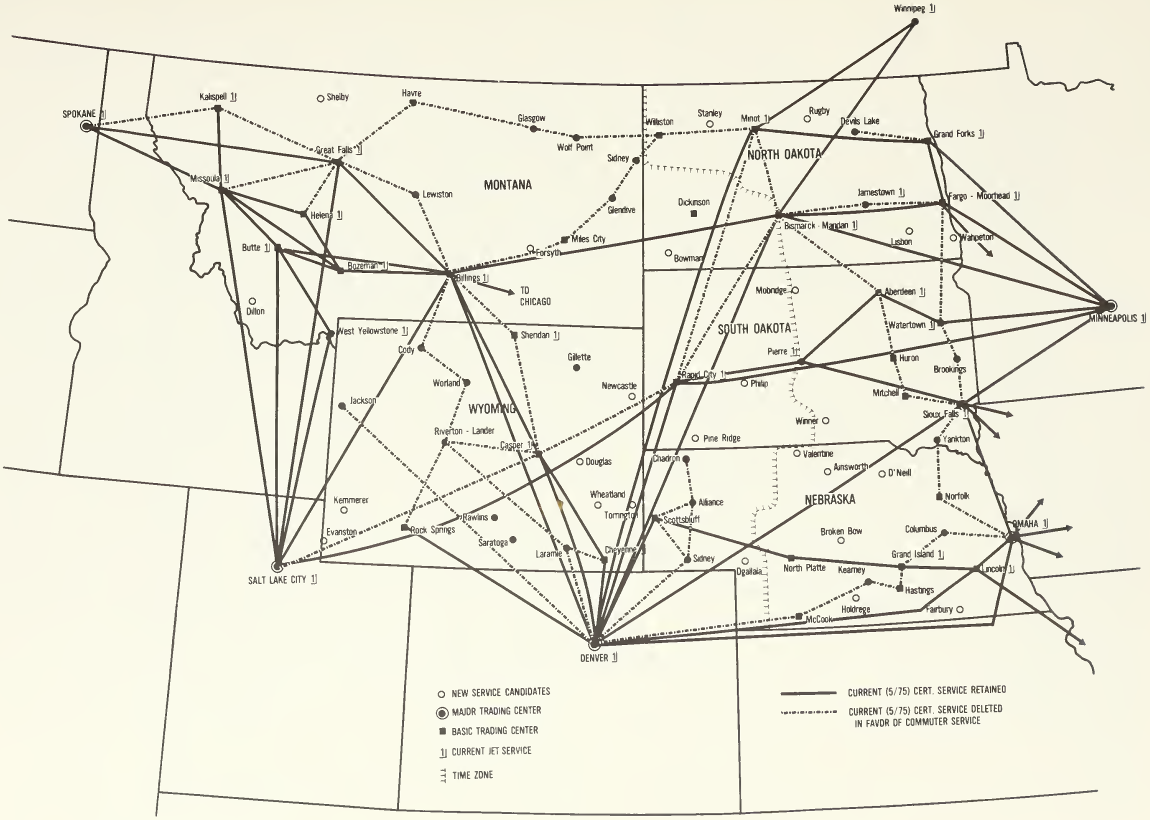


Figure 9. Basic Network Concept--Certificated Air Service Impacts

- Subregional Collector Concept

Table V identifies the ground rules used to structure the Subregional Collector Concept. This concept was devised to explore, on a realistic basis, the feasibility of using a commuter airline network to feed passengers to logical collector points in the region that would be interconnected by certificated air service. Eight collector airports were selected based upon actual 1973 travel patterns, current levels of certificated service, airport facility adequacy, and geographic location to minimize travel circuitry. A commuter service network was then structured to feed these airports where actual or predicted patronage was not sufficient to provide adequate route load factors for larger certificated airline aircraft. Current certificated air service was assumed to be retained, in general, to non-collector service points if actual or predicted patronage was in excess of approximately 30 to 40 passengers per day.

Figures 10 and 11 identify the resulting commuter network and the impacts on certificated air service. Again, as in the case of the Basic Network Concept, certain of the certificated service routes currently employing jet aircraft, but exhibiting low travel volumes, were investigated regarding the feasibility of replacement service. In order to interconnect selected collector points properly, new certificated air service was also assumed. This new service includes Billings-Rapid City, Fargo-Rapid City, Jackson-Rock Springs (to access Denver and return), Rock Springs-Denver service, and, for feasibility analysis, Aberdeen direct to Minneapolis. Of these routes, Frontier Airlines has recently been authorized by the CAB to serve Fargo-Rapid City and has instituted seasonal service between Billings and Rapid City in the past. Although this study did not attempt to analyze new certificated air service markets, it is possible that the potential of increased patronage to collector points resulting from commuter air service may further encourage new service between such points as well as the possibility of increased service levels between collector points presently served. The results of analyzing the technical and economic feasibility of this alternative concept for each route are presented in detail in Appendix 2.

## TABLE V. SUBREGIONAL COLLECTOR CONCEPT

Specifies Collector Airports in Region Based on Geographic, Facility, and 1973 Actual Air Travel Patterns and Volumes

Billings, Montana

Bismarck, North Dakota

Casper, Wyoming

Fargo, North Dakota

Omaha, Nebraska

Rapid City, South Dakota

Scottsbluff, Nebraska

Sioux Falls, South Dakota

Commuter Air Service Eligibility

- Currently Served (May 1975)

  Generally less than 10-15,000 annual (26-41 daily) person trips from each service point

  Currently served by prop-jet aircraft and not considered by airlines as having jet potential

- Currently Unserved

  Same as Basic Network Concept

Service Strategy

- Collector Airports Fed by Commuters and Interconnected by Certificated Air Service
- Certificated Service Retained to Noncollector Service Points if 1973 Patronage Provides for Adequate Large Aircraft Load Factors on a Route Basis

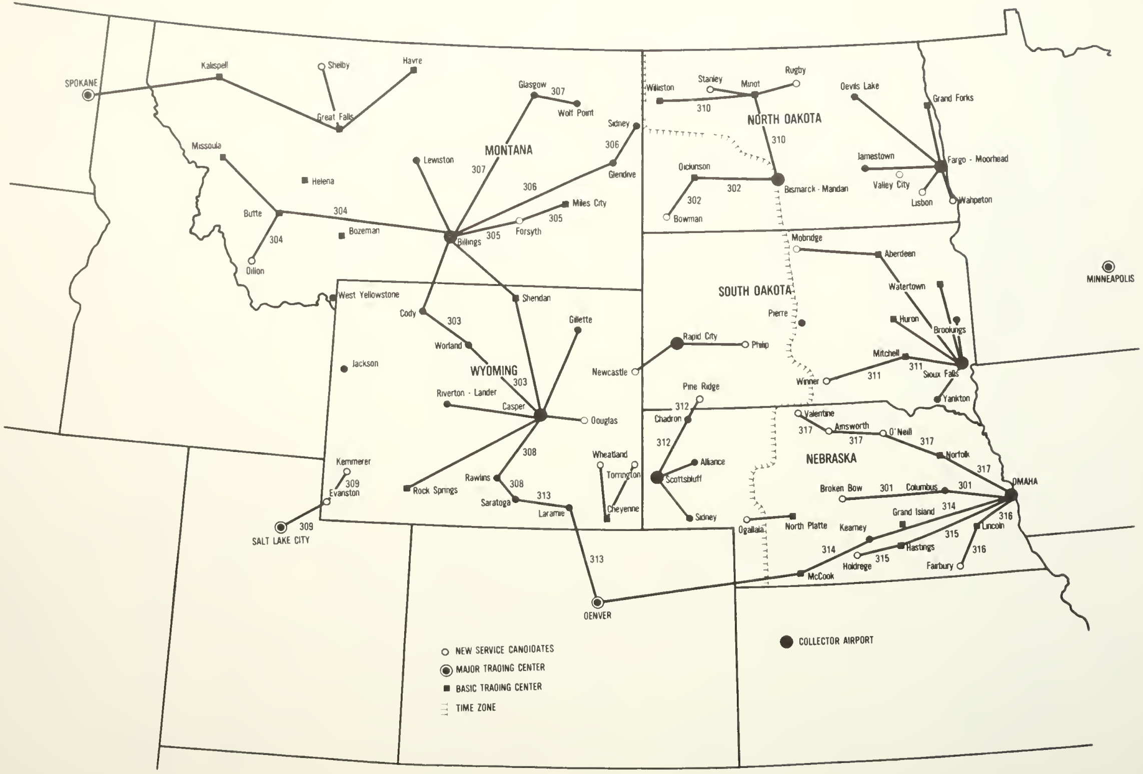


Figure 10. Subregional Collector Concept--Commuter Air Service

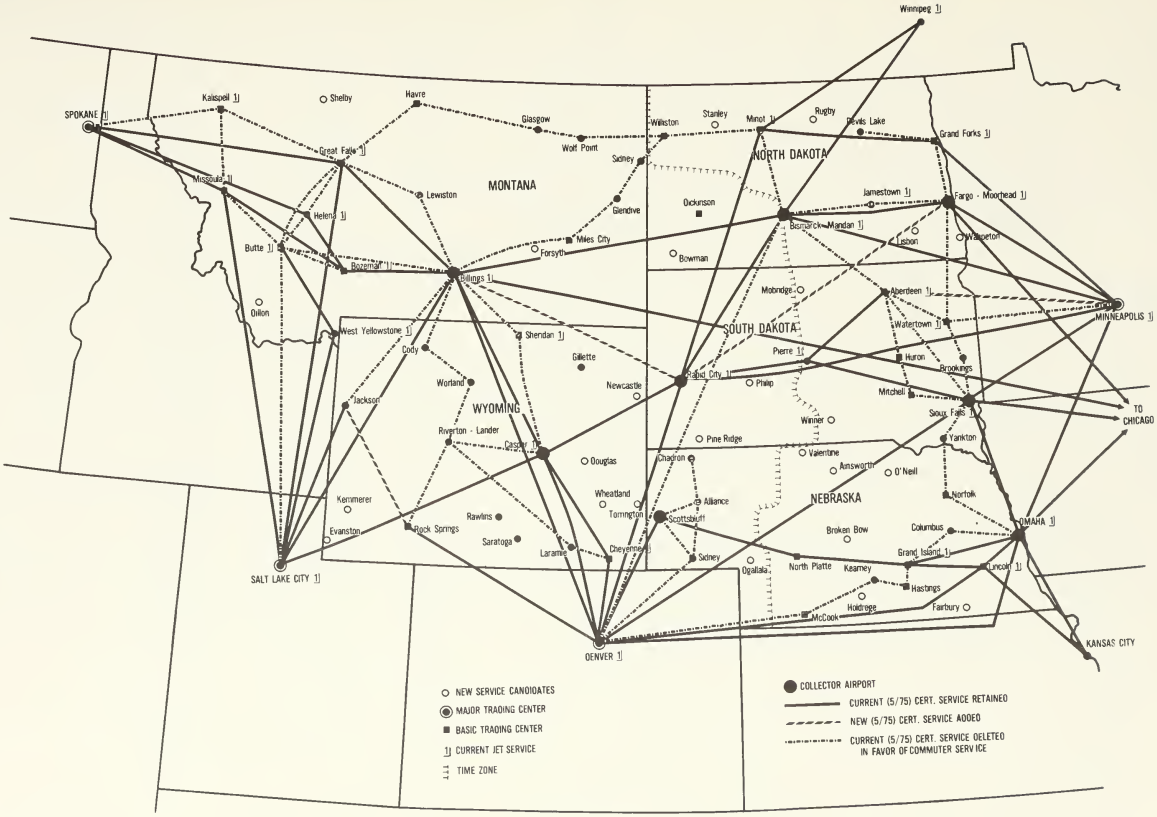


Figure 11. Subregional Collector Concept--Certificated Air Service Impacts

- Regional Collector Concept

As one aspect of this study was originally to address the feasibility of a centrally located regional airport fed principally by a commuter air service network, a more extreme regional collector concept was investigated. Although a single, certificated regional airport, fed almost exclusively by commuter airlines, was clearly not indicated by the region's travel patterns and volumes, and geography, an attempt to limit the number of collector points in the region was made. Figure 12 identifies a concept where collector airports are limited to Billings, Rapid City, Fargo, Sioux Falls, and Omaha. Ground rules used to structure this concept are presented in Table VI. Certificated air service was retained only where average route load factors of 40 to 50 percent on 90- to 110-passenger aircraft could be projected at a minimum service frequency of two round trips per day. All other points were assumed to be served by commuter air service. Upon examination and subsequent to discussions with representatives of the region's certificated air carriers and state officials, it was jointly concluded that this extreme collector concept was considered unrealistic to pursue further for the following reasons:

- A massive readjustment of the current certificated air service system would be required through the airlines and the CAB.

- A number of currently profitable certificated airline routes would require replacement with commuter air service--a fact expected to be heavily contested by the airlines.

- Major community objections would be expected where current adequate and unsubsidized certificated air service would be deleted.

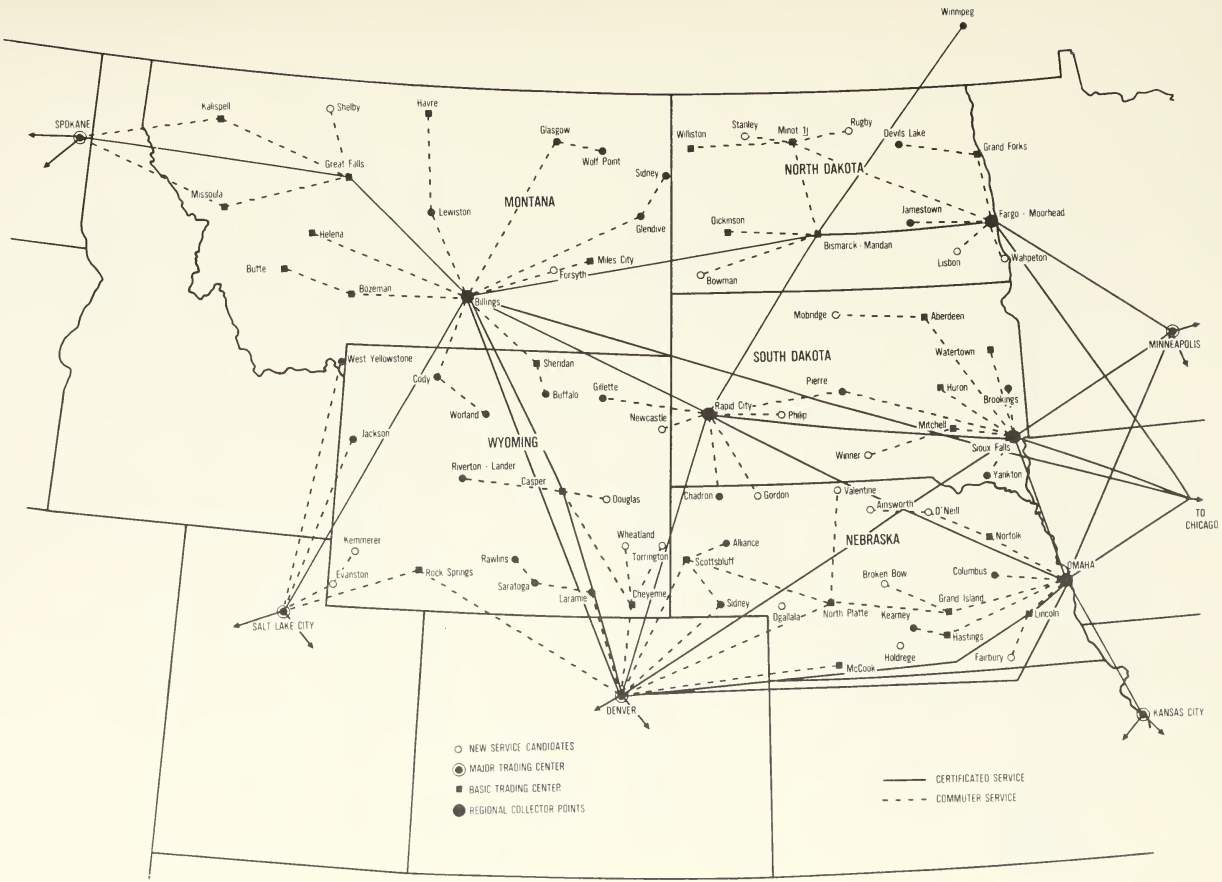


Figure 12. Regional Collect Airport Alternative

TABLE VI. REGIONAL COLLECTOR CONCEPT

Specifies Limited Number of Collector Airports in Region Based on Geographic, Facility, and 1973 Actual Air Travel Patterns and Volumes

Billings, Montana

Fargo, North Dakota

Omaha, Nebraska

Rapid City, South Dakota

Sioux Falls, South Dakota

Commuter Air Service Eligibility

- Currently Served (May 1975)

  Generally less than 30,000 annual (82 daily) person trips from each service point

- Currently Unserved

  Same as Basic Network Concept

Service Strategy

- Collector Airports Fed by Commuters and Interconnected by Certificated Air Service
- Certificated Service Retained to Noncollector Service Points if 1973 Patronage Provides for Adequate Route Load Factors to Justify Two Round Trips per Day by 90-to-110-Passenger Jet Aircraft

- A number of travelers in some communities would be required to back-haul extensively (i.e., travel away from their primary destination) in order to make proper connections with certificated air service.

In general, it was considered that the study direction should be more oriented toward an air service system that could be more readily implemented to serve the region's immediate basic air service needs rather than to attempt to justify a regional airport concept that may be extremely difficult to implement.

Another consideration was the need for a regional airport to relieve the future congestion of major airports outside the region (e.g., Denver and Minneapolis). Members of the respective regional FAA airport planning offices were thus contacted, with the following information resulting:

- Denver will have sufficient capacity to accommodate growth anticipated through the year 2000 with a planned expansion program to accommodate 70 million annual passengers.

- Salt Lake City will have sufficient capacity to accommodate anticipated growth through 1994 and is currently involved in an $18 million land acquisition program.

- Spokane will have sufficient capacity to handle growth in demand through 1985. Problems are interference with Fairchild AFB, and eastern approaches and departures over downtown Spokane. However, these are not felt to warrant airline diversion.

- Minneapolis has no foreseen congestion problems. New airport is expected in ten years.

- Kansas City has a new airport. No foreseen congestion problems.

- St. Louis. Lambert Field is currently operating at, or near, its IFR runway capacity. The terminal is being expanded, but the airport cannot be expanded because of surrounding urbanization. Current study will probably define the need for a new airport. The rule-of-thumb time period for major new airport development is ten years.

- Chicago. O'Hare is currently congested. Airlines should be encouraged to develop alternative connections.

Thus, with the exception of Chicago and possibly St. Louis, it does not appear that airport congestion relief through the construction of an Old West Regional airport that would provide direct flights to other domestic or even international markets is a motivating factor.

- AIRCRAFT SELECTION
- COMMUTER AIRLINE ECONOMICS

# COMMUTER AIRCRAFT AND AIRLINE ECONOMICS

## Aircraft Selection

Prior to examining commuter aircraft for consideration in the potential markets in the Old West Region, aircraft selection criteria were established. As identified in Table VII, these criteria addressed altitude capabilities, capacity, speed, range, marginal weather performance, take-off distance requirements, and equipment for safe operation in view of potential contingencies. In view of these criteria, a number of available aircraft and their related investment costs were examined.

Commuter air carriers throughout the country predominately use twin-engine aircraft of 5- to 19-passenger capacities. Some carriers in the higher-density markets employ larger aircraft in the 20- to 30-passenger range, but are then required to operate under the more stringent FAA Federal Aviation Regulation Part 121 and are required to use a cabin attendant. Based upon the relatively low population densities of the Old West Region, aircraft in the 5- to 19-passenger capacity range were primarily considered. Table VIII summarizes the more popular aircraft in this capacity range, their respective investment and operating costs, and selected performance characteristics. For the purposes of this study, the costs and performance of the following representative aircraft were used in the air demand and route analyses:

| | |
|---|---|
| 4 to 6 Passengers | Piper Aztec (Turbocharged) |
| 8 to 10 Passengers | Cessna 402B |
| 10 to 15 Passengers | Beech 99 |
| 15 to 19 Passengers | DeHavilland Twin Otter |

## TABLE VII. COMMUTER AIRCRAFT SELECTION CRITERIA

### Altitude

For twin engine, capability to climb approximately 50 ft/min at minimum enroute altitude (MEA) or 5000 ft (whichever is higher) along designated route and meet take off and landing requirements of FAR Part 135 (for 10 or more passenger aircraft) or Part 23 (for less than 10-passenger aircraft), all with critical engine inoperative.

### Capacity

Size to projected demand to each service point at no more than 75% maximum load factor (65% segment load factor).

### Speed

Size to stage length and comfort factors. Will probably be dictated by market availability.

### Take-Off and Landing

Size to service point runway length with selected load limiting considerations. Use accel/stop or dry field landing whichever is greater. (Trade-off with runway improvements).

### Range

Size to desired stage length in view of IFR requirements. (Primary, alternate, and 45 min fuel).

### Avionics

Dual Nav/Comm (200/720 channel) including ILS capability, transponder, DME, ADF, encoding altimeter, intercom, radar altimeter, horizontal situation indicator or flight director, 3-axis auto pilot.

### Other Equipment

De-icing equipment and ELT. Oxygen equipment for pilots for routes with MEA's >12, 000 ft MSL or >10, 000 ft MSL for more than 30 min. Oxygen equipment for all occupants for operations above 15, 000 ft MSL. (Unpressurized aircraft.) Consideration should also be given to on-board carrying of chocks, tow bars, fire extinguishing equipment, engine shrouds, etc., to facilitate ground handling requirements at service points.

## TABLE VIII. REPRESENTATIVE COMMUTER AIRCRAFT

| Passenger Capacity | Aircraft | No. Used by Commuters in 1972 | Approximate New Investment Cost (Equipped), ($) | Direct Operating Cost ($/hr)[a] | Approximate Cruise Speed (mph) |
|---|---|---|---|---|---|
| 4-6 | Piper Aztec E (Turbo) | 67 | 134,000 | 65 | 210 |
| | Aero Commander | 12 | 172,000 | 56 | 203 |
| | Cessna 310 | 6 | 134,000 | 52 | 213 |
| 8-10 | Beech 18 | 152 | 59,000 (used) | 61 | 214 |
| | Cessna 402B | 52 | 177,000 | 67 | 215 |
| | Piper Navajo (Turbo) | 27 | 183,000 | 72 | 231 |
| | Piper Navajo (Press) | | 325,000 | 104 | 218 |
| | Britten Norman Islander | 21 | 171,000 | 64 | 160 |
| 10-15 | Beech 99 | 98 | 591,000 | 152 | 282 |
| | DH 104 Dove (Riley Conversion) | 6 | b | b | 250 |
| 15-19 | DHC-6 Twin Otter | 66 | 769,000 | 161 | 197 |
| | DH 114 Heron | 31 | b | b | 183 |
| | Shorts Skyvan | 4 | 829,000 | 159 | 195 |
| | Swearingen Metro (Press) | 0 | 874,000 | 182 | 296 |

[a] 2500 hours yearly utilization

[b] Not available

- Commuter Airline Economics

Although commuter airlines are capable of providing dependable scheduled airline service to small communities, the economics of such service varies considerably depending upon the size and type of aircraft utilized, frequency of service, stage length, number of communities served, fare, and most important the number of passengers carried.

The size and type of aircraft utilized depends upon the airline's existing fleet and its ability to finance the acquisition of needed aircraft. In some instances, the result is that either oversized or undersized aircraft are used on some routes. The daily demand and airline routing determine the schedule and frequency of service. In many instances, the availability or non-availability of attractive joint fares and connecting schedules affects demand.

Service to and between markets in major metropolitan areas account for a large proportion of commuter airline traffic. According to 1973 CAB Commuter Carrier Traffic Statistics, 50 of 1,244 markets account for 55 percent of all commuter passengers. These statistics also show that 883 of these markets generate less than five passengers per day. The economics of service to these low-density markets is one of the major problems facing existing or potential commuter air carriers.

Determination of the economics of commuter airline service requires analysis and evaluation of their traffic and financial statistics. However, unlike the nation's CAB certificated carriers--whose traffic and financial statistics, aircraft operating costs, and performance data are periodically published--commuter airlines are not required to adhere to a uniform financial system nor do they publish their financial results. In order to make available the necessary data, annual traffic and financial statistics for a number of commuter airlines have been compiled. The commuter airlines that have furnished data include the following:

- Air Midwest
- Air South
- Air Wisconsin
- Cochise Airlines
- Execuair
- Midstate Air Commuter
- Rocky Mountain Airlines
- Royale Airlines
- Suburban Airlines
- Sun Valley Key Airlines

Airline operating costs are composed of direct and indirect costs. Direct operating costs are aircraft-related and provide a means for assessing and comparing the operating economics of various aircraft over a given distance. Indirect operating costs cover general airline support services and administrative operations.

As used in the direct operating cost analysis, aircraft costs include the basic cost of the aircraft plus necessary optional equipment and avionics. These costs were obtained from 1975 prices appearing in various aviation publications and are shown for each of the candidate aircraft in Table IX and X.

Optional equipment items were developed for each of the various groups of aircraft based on safety and operational requirements. All aircraft were equipped with de-icing equipment, co-pilot instruments, oxygen system, propeller synchronization, and commuter-type interiors. Costs for this equipment were obtained from manufacturers' price lists and adjusted, in some instances, for standard equipment.

Avionics equipment items were developed for each of three weight groups based on safety and operational requirements as shown in Table XI. These items include communication and navigation equipment, ATC transponder, automatic direction finder, distance measuring equipment, autopilot, horizontal situation indicator, flight director, area navigation, and radar and encoding altimeters.

## TABLE IX. AIRCRAFT COST AND PERFORMANCE

| Aircraft Cost and Performance | Piper | | | | |
|---|---|---|---|---|---|
| | Aztec E | T Aztec E | T Navajo B | Navajo Chieftan | P Navajo B |
| **Flyaway Cost** | | | | | |
| Basic Cost | $ 88,000 | $ 99,000 | $139,000 | $168,000 | $241,000 |
| Optional Equipment | 16,000 | 15,000[a] | 24,000 | 20,000 | 45,000 |
| Avionics | 20,000 | 20,000 | 20,000 | 20,000 | 45,000 |
| Total Flyaway Cost | $124,000 | $134,000 | $183,000 | $218,000 | $325,000 |
| **Direct Operating Cost Per Block Hour – 2500-Hr Utilization** | | | | | |
| Flying Operations | | | | | |
| Flight Crew | $ 16.75 | $ 16.75 | $ 18.70 | $ 18.70 | $ 18.70 |
| Fuel and Oil | 17.75 | 23.21 | 24.57 | 18.70 | 36.86 |
| Insurance | 0.89 | 0.96 | 1.32 | 1.57 | 2.34 |
| Other | 0.45 | 0.48 | 0.66 | 0.78 | 1.17 |
| Total Flying Operations | $ 35.84 | $ 41.40 | $ 45.25 | $ 51.08 | $ 59.07 |
| Direct Maintenance | $ 12.30 | $ 17.93 | $ 19.40 | $ 25.51 | $ 31.69 |
| Depreciation | $ 4.96 | $ 5.36 | $ 7.32 | $ 8.72 | $ 13.00 |
| Total DOC Per Block Hour | $ 53.10 | $ 64.69 | $ 71.97 | $ 85.31 | $103.78 |
| **Operational Data** | | | | | |
| TOGW | 5,200 | 5,200 | 6,300 | 7,000 | 7,800 |
| Cruise Speed (MPH) | 208 | 227 | 231 | 250 | 218 |
| Fuel Consumption (gal/hr) | 26 | 34 | 36 | 44 | 54 |
| Crew Size[b] | 1 | 1 | 1 | 1 | 1 |
| No. Passengers | 5 | 6 | 8 | 9 | 7 |

[a] Adjusted for standard equipment

[b] +20% co-pilot utilization for bad weather

TABLE IX. AIRCRAFT COST AND PERFORMANCE (Cont.)

| Aircraft Cost and Performance | Britten Norman Islander | Cessna 402B | Beech 99 | Swear-ingen Metro | Dehavil-land DHC-6-300 |
|---|---|---|---|---|---|
| Flyaway Cost | | | | | |
| Basic Cost | $127,000 | $139,000 | $536,000 | $815,000 | $700,000 |
| Optional Equipment | 24,000 | 18,000[a] | 24,000 | 14,000[a] | 24,000 |
| Avionics | 20,000 | 20,000 | 31,000[a] | 45,000 | 45,000 |
| Total Flyaway Cost | $171,000 | $177,000 | $591,000 | $874,000 | $769,000 |
| Direct Operating Cost Per Block Hour — 2500-Hr Utilization | | | | | |
| Flying Operations | | | | | |
| Flight Crew | $ 18.70 | $ 18.70 | $ 30.23 | $ 30.23 | $ 30.23 |
| Fuel and Oil | 21.16 | 23.21 | 53.13 | 65.26 | 53.13 |
| Insurance | 1.40 | 1.27 | 4.26 | 6.29 | 5.54 |
| Other | 0.70 | 0.64 | 2.13 | 3.15 | 2.77 |
| Total Flying Operations | $ 41.96 | $ 43.82 | $ 89.75 | $104.93 | $ 91.67 |
| Direct Maintenance | $ 14.58 | $ 15.69 | $ 38.23 | $ 42.16 | $ 38.23 |
| Depreciation | 7.80 | 7.08 | 23.64 | 34.96 | 30.76 |
| Total DOC Per Block Hour | $ 64.34 | $ 66.59 | $151.62 | $182.05 | $160.66 |
| Operational Data | | | | | |
| TOGW | 6,000 | 6,300 | 10,900 | 12,500 | 12,500 |
| Cruise Speed (MPH) | 160 | 215 | 282 | 296 | 197 |
| Fuel Consumption (gal/hr) | 31 | 34 | 92 | 113 | 92 |
| Crew Size | 1[b] | 1[b] | 2 | 2 | 2 |
| No. Passengers | 9 | 9 | 15 | 19 | 19 |

[a] Adjusted for standard equipment

[b] +20% co-pilot utilization for bad weather and training

TABLE X. 1975 AIRCRAFT COST COMPARISON

| Aircraft | Flyaway Cost | | | |
|---|---|---|---|---|
| | Basic | Optional Equipment | Avionics | Total |
| Piper Aztec E | $ 88,000 | $ 16,000 | $ 20,000 | $124,000 |
| Piper T Aztec E | 99,000 | 15,000[a] | 20,000 | 134,000 |
| Piper T Navajo B | 139,000 | 24,000 | 20,000 | 183,000 |
| Piper P Navajo B | 241,000 | 39,000 | 20,000 | 300,000 |
| Britten Norman Islander | 127,000 | 24,000[a] | 20,000 | 171,000 |
| Cessna 402B | 139,000 | 18,000 | 20,000 | 177,000 |
| Beech 99 | 536,000 | 24,000 | 31,000[a] | 591,000 |
| Swearingen Metro | 815,000 | 14,000[a] | 45,000 | 874,000 |
| De Havilland DHC-6-300 | 700,000 | 24,000 | 45,000 | 769,000 |

[a] Adjusted for standard equipment.

## TABLE XI. TYPICAL AVIONIC EQUIPMENT COST ESTIMATES FOR COMMUTER AIRLINE SERVICE

| Avionic Equipment | 4-8 Pass. Aircraft[d] | 9-19 Pass. Aircraft[c] | Over 19 Pass. Aircraft[c] |
|---|---|---|---|
| Dual VHF Communications, 720 Channel Capacity & Navigation (VOR/ILS) 200 Channel Capacity & Marker Beacon Receiver | $ 5,000 | $ 12,000 | $ 23,000 |
| ATC Transponder - 4096 Codes | 600 | 600 | 1,900 |
| Automatic Direction Finder | 1,200 | 1,500 | 3,300 |
| Distance Measuring Equipment | 1,900[a] | 2,900 | 13,000 |
| Autopilot | 3,000 | 9,200 | |
| Horizontal Situation Indicator | 2,500 | | |
| Flight Director | | 8,500 | 40,000[b] |
| Area Navigation (VOR/DME) | 2,000[a] | 2,000[a] | 27,000 |
| Radar Altimeter | 2,500 | 5,200 | 11,000 |
| Encoding Altimeter | 1,200 | 3,100 | 6,700 |
| Weather Radar | | | 20,000 |
| Total Avionic Equipment | $ 19,900 | $ 45,000 | $145,900 |

[a] Not TSO'D

[b] Includes Autopilot

[c] Some increased cost are shown for functionally similar equipment. As aircraft size increases, increased panel space may be used to provide more reliability and additional functions within generic equipment. By employing separate function black boxes (e.g., nav and a comm vs nav/com) reliability is enhanced by distributing heat sources and avoiding any use of common subsystems (i.e., power supplies). Even though higher absolute costs result, the avionics cost relative to the total capital investment is lower for the larger aircraft and dispatch reliability is improved.

[d] Up to 7,799 lbs gross weight.

### (1) Direct Operating Costs

Direct operating costs (DOC) consist of three elements of cost: flying operations, direct maintenance, and depreciation. The DOC per block hour for various candidate aircraft are also shown in Table IX and are based on 2500 hours annual utilization. These costs are based on reported commuter airline experience and manufacturer estimates of cost and performance.

#### (a) Flying Operations

Flying operations consist of flight crew costs, fuel and oil, insurance, and other costs. These costs are based on the amounts and rates shown in Table XII. Flight crew costs are based on a 1975 commuter airline pilot salary survey, while employee and pilot benefits are based on reported commuter airline costs. In actual commuter airline operation, a pilot's salary does not usually vary according to the aircraft that he operates and is generally based on the largest aircraft in the airline's fleet. This results in flight crew costs for smaller aircraft being at the same level as that of larger aircraft for some airlines.

Fuel costs are based on average mid-1975 costs. These costs have increased significantly over the last year and are likely to increase further during the last half of 1975. Reported costs vary widely depending upon whether the airline acts as a distributor or fuels extensively at stations away from its main fueling station. Commuter airline fuel is subject to both federal and state taxes and also to airport fuel flowage fees.

Insurance costs are shown for hull insurance and are based upon reported airline experience. Aircraft property taxes have been included in other costs and are based on the composite experience of commuter airlines.

#### (b) Direct Maintenance

Commuter airlines report a wide range of maintenance costs because of differing operational use and the expensing of airframe and engine overhaul costs. Some carriers expense overhaul costs as incurred while others

## TABLE XII. FLYING OPERATIONS COST FOR COMMUTER AIRLINE SERVICE

| Cost Factors | Per Month | | | Per Hour | | |
|---|---|---|---|---|---|---|
| | Up to 5,999 lbs | 6,000- 10,899 lbs | 10,900- 12,500 lbs | Up to 6,299 lbs | 6,300- 10,899 lbs | 10.900- 12.500 lbs |
| Flying Operations | | | | | | |
| Flight Crew | | | | | | |
| Pilot | 900 | 1,010 | 1,100 | $11.25 | $12.63 | $13.75 |
| Co-Pilot | 650 | 700 | 760 | 1.63 (a) | 1.75 (a) | 9.50 |
| | | | | $12.88 | $14.38 | $23.25 |
| Employee Benefits | 20% | 20% | 20% | 2.58 | 2.88 | 4.65 |
| Pilot Expense | 10% | 10% | 10% | 1.29 | 1.44 | 2.33 |
| Total Flight Crew | | | | $16.75 | $18.70 | $30.23 |
| Fuel Cost (¢/Gal) | | | | | | |
| Turbine Fuel | .55 | .55 | .55 | | | |
| AV Gas | .65 | .65 | .65 | | | |
| Oil (% of Fuel Cost) | 5.0% | 5.0% | 5.0% | | | |
| Insurance (% Aircraft Cost) | 1.8% | 1.8% | 1.8% | | | |
| Other | | | | | | |
| Taxes (% Aircraft Cost) | 0.9% | .9% | .9% | | | |

a. 20% Co-Pilot Utilization for Bad Weather and Training utilize an annual reserve for such costs. Depending upon the year of overhaul and the method used, overhaul costs vary considerably. In most instances, manufacturers' estimates of direct maintenance and overhaul allowances were used as reported maintenance costs approximated those estimates.

(c) Depreciation

Commuter airline accounting practices generally reflect an eight-year depreciation period with a 20 percent residual value. These depreciation parameters were applied to all aircraft.

While aircraft that are large and fast offer lower seat mile costs than smaller and slower aircraft, larger aircraft require good seat load factors and daily utilization for economy of operation. On long haul routes, high cruise speed results in significant time and cost savings; however, on short stage lengths, a combination of take-offs, air maneuvers, and climb and descent requirements tend to minimize the savings due to high cruise speed.

In actual airline operation the direct operating costs will vary depending upon whether the aircraft is new or used, actual flight crew and fuel costs, maintenance allocations for aircraft overhaul, and depreciation or lease practices. The direct operating costs of each of the candidate aircraft have been based on the purchase of a new aircraft. A commuter airline may, however, choose to purchase a used aircraft or lease a new or used aircraft and, depending upon the age of the aircraft acquired and the lease cost, will experience higher or lower direct operating costs.

If a four-year-old aircraft is purchased, the purchase cost is likely to vary from 48 to 68 percent of the cost of a new aircraft, as shown in Table XIII. If a new aircraft were leased, the lease cost based on mid-1975 lease rates would range from 10 to 11 percent on an eight-year lease. For a four-year-old aircraft, the lease rate would be the same, but the lease period would

TABLE XIII. MARKET VALUES OF SELECTED AIRCRAFT

| Aircraft | 1975 Cost | 1971[a] Average Cost | Percent Difference |
|---|---|---|---|
| Cessna 402B | $177,000 | $105,000 | 59.3 |
| Piper | | | |
| Aztec E | 124,000 | 60,000 | 48.4 |
| T Aztec E | 134,000 | 67,500 | 50.4 |
| T Navajo B | 183,000 | 105,000 | 57.4 |
| P Navajo B | 325,000 | 170,000 | 52.3 |
| Beech 99 | 591,000 | 400,000 | 67.7 |

[a] Source: Aircraft Bluebook, Third Quarter 1975, Aircraft Dealers Service Association, Aurora, Colorado.

likely be only four years. A longer lease period would depend upon whether the aircraft was in top condition. While a lease would result in the savings of a down payment, which is generally 20 percent of the purchase price, the availability of a suitable used aircraft and the ability of the airline to obtain a lease may limit its use. The financial condition and history of the airline must be acceptable to any financing institution if any financing or leasing is to take place.

The impact of each of the alternative financing concepts on direct operating costs using the Piper Turbo Navajo B as an example is shown in Table XIV. This analysis shows that the purchase of a used aircraft would decrease direct operating costs 9.5 percent, while the lease of a new aircraft would increase direct operating costs 8.9 percent, or 7.1 percent for a used aircraft.

### (2) Indirect Operating Costs

Indirect operating costs (IOC) consist of the costs of passenger service, aircraft and traffic servicing, reservations and ticket sales, sales and advertising, general and administrative services, and depreciation of ground property. These costs vary widely as a result of differences in the number of aircraft operated, airports served, frequency of service, average stage length, and various services provided on the aircraft or at terminals. In addition, commuter airlines serving some large airports are subject to substantially higher landing, fuel flowage, and airport terminal fees.

Commuter airline IOCs are further defined and described as follows:

#### (a) Passenger Service

Passenger service consists of activities contributing to the comfort, safety, and convenience of passengers while in-flight and when flights are interrupted. Commuter airline costs generally are limited to passenger liability insurance and interrupted trip expenses. Since FAA regulations do not require cabin

TABLE XIV. IMPACT ON DIRECT OPERATING COSTS--ALTERNATIVE FINANCING CONCEPTS FOR PIPER NAVAJO B

| Per Block Hour 2,500 Hours Annual Utilization | Aircraft Purchase | | Aircraft Lease | |
|---|---|---|---|---|
| | New[a] Aircraft | Used[b] Aircraft | New[a] Aircraft | Used[b] Aircraft |
| Direct Operating Costs | | | | |
| Flying Operations | | | | |
| Flight Crew | $18.70 | $18.70 | $18.70 | $18.70 |
| Fuel and Oil | 24.57 | 24.57 | 24.57 | 24.57 |
| Insurance | 1.32 | 0.76 | 1.32 | 0.76 |
| Other | 0.66 | 0.38 | 0.66 | 0.38 |
| Total Flying Operations | $45.25 | $44.41 | $45.25 | $44.41 |
| Direct Maintenance | $19.40 | $19.40 | $19.40 | $19.40 |
| Depreciation or Lease | $ 7.32 | $ 4.20 | $13.72[c] | $13.25[d] |
| Total DOC Per Block Hour | $71.97 | $68.01 | $78.37 | $77.06 |
| Percent Increase (Decrease) | — | (9.5) | 8.9 | 7.1 |

[a] New cost, $183,000

[b] Used cost — 4 year old aircraft, $105,000

[c] Lease cost 10%, 8 years

[d] Lease cost 10%, 4 years

attendants for aircraft equiped with less than 20 seats, cabin attendants are not generally provided.

Passenger liability insurance rates for commuter air carriers are considerably higher than for CAB certificated carriers, as their passenger liability rates tend to be based on the number of seats whether occupied or not. CAB certificated carriers receive the benefit of a payload variation formula based on revenue passenger miles.

### (b) Aircraft and Traffic Servicing

Aircraft and traffic servicing covers costs of ground personnel for handling and servicing aircraft, scheduling, landing and parking of aircraft, and rental of facilities. Commuter air carrier costs generally are for salaries and benefits of ground personnel or contracted services, landing fees, hangar rental, and station maintenance.

At airports with infrequent commuter airline service, part-time personnel may be used to service the aircraft or the commuter airline may contract all aircraft and traffic scheduling to another carrier. At some airports, a CAB certificated airline sometimes will provide a commuter airline with terminal, gate, and airport servicing.

### (c) Reservation and Ticket Sales

These costs cover the staffing and operation of a reservation and ticket sales system and the development of tariffs and operating schedules. For commuter air carriers, these costs are generally limited to salaries and benefits of reservationists, communications, commissions, space rental, and ticket supplies. While some commuter airlines are tied in the CAB certificated carrier's system, most are not. Commuter airlines do not have their full connecting schedules published nor necessarily receive the same fare proration that local service carriers receive under joint-fare agreements.

### (d) Sales and Advertising

These costs are to promote the use of air transportation and the commuter carrier. Commuter airline sales and advertising generally consist of small newspaper ads and short radio spots plus displays and schedules at various airports. Many commuter airlines use contacts with leading businesses to promote travel. Many also rely on travel agents and certificated carriers to route connecting passengers through their airline.

### (e) General and Administrative Services

The general and administrative costs are of a general corporate nature, such as accounting, purchasing, taxes, and management. Like any business, commuter airlines have a minimum level of general and administrative costs. As they operate under minimum regulatory requirements, many are able to keep these costs at a low level. The number and salaries of management personnel were also found to vary widely, with the costs increasing with the level of service provided.

### (f) Depreciation of Ground Property

Depreciation of property and equipment other than flight equipment is covered.

The formula for indirect operating costs as a function of aircraft departure based upon composite commuter air carrier experience is as follows:

$$\begin{aligned}\text{IOC per aircraft departure} = {} & \$13.58 + 2.38\ (\text{number of passengers}) \\ & +0.013876\ (\text{available seat miles}) \\ & +0.004392\ (\text{revenue passenger miles})\end{aligned}$$

### (3) Return on Investment

An average return on investment (ROI) per year was developed based on the allowable return, value of flight and non-flight equipment, and facilities considering average life, interest, debt/equity, and provision for federal income taxes. The following factors were utilized:

- Allowable ROI - 12.35 percent in accordance with CAB Air Midwest Subsidy - Flow Through Decision, Order 74-1-78, 14 Jan 1974
- Non-Flight Equipment - 16 percent for all aircraft
- Average Life - 4 years based on 8-year depreciation period for all aircraft
- Interest - 9 percent
- Debt/Equity Ratio - 80/20
- Federal-State Income Taxes - 50.5 percent (combined rate)

The ROI requirement per operating hour for each of the aircraft is as follows:

| Aircraft | ROI/hr | Aircraft | ROI/hr |
|---|---|---|---|
| Aztec E | $ 5.48 | Britten Norman Isl. | $ 8.62 |
| T Aztec E | 5.92 | Cessna 402B | 7.82 |
| T Navajo B | 8.09 | Beech 99 | 26.12 |
| Navajo Chieftan | 9.64 | Swearingen Metro | 38.63 |
| Press Navajo B | 14.37 | DHC 6-300 | 33.99 |

### (4) Commuter Airline Start-Up Costs

One-time start-up costs for low-density service have been estimated based upon whether the airline is a new or existing carrier in the geographical area. Table XV identifies these costs.

Organizational and regulatory costs cover the legal expenses to form the airline and to support regulatory route applications and hearings within the Old West Region. As service will be largely to low-density points, it is not

TABLE XV. COMMUTER AIRLINE START-UP COSTS

| | New Airline | Existing Carrier |
|---|---|---|
| General Airline | | |
| Organizational and Regulatory | | |
| Organizational Expense | $ 600 | |
| Regulatory Application and Hearings | 1,000 | $ 500 |
| Market Development | | |
| Advertising and Publicity | 800 | 600 |
| Ticketing and Scheduling | 1,500 | 1,000 |
| Pre-Service | | |
| Pilot Training | 1,500 | 1,200 |
| Deposits | | |
| Telephone and Reservation | 1,500 | 1,200 |
| Surety and Performance Bonds | 350 | 300 |
| Office Equipment and Supplies | 1,200 | 1,000 |
| Pre-Paid Expenses | 800 | 600 |
| Total General Airline Start-Up Costs | $ 9,250 | $ 6,400 |
| Station Related (Per Station) | | |
| Aircraft Handling Equipment | $ 1,200 | $ 1,200 |
| Terminal Facilities | 500 | 500 |
| Total | $ 1,700 | $ 1,700 |
| Total Start-Up Costs | | |
| 2 Stations | $12,650 | $ 9,800 |
| 4 Stations | 16,050 | 13,200 |
| 6 Stations | 19,450 | 16,600 |
| 8 Stations | 22,850 | 20,000 |

expected that such hearings will involve many airlines and parties; therefore, the hearings can be accomplished at moderate cost. A commuter airline that is already in existence and providing service in the region should have substantially lower regulatory costs as it is already registered with state and federal aviation agencies and will only be extending service.

Market development costs cover local radio and newspaper advertising and publicity expenses related to obtaining the support of travel agents and various business and trade associations. Ticket and scheduling costs cover the printing of tickets and development of airline schedules.

Pre-service costs cover pilot training to familiarize them with airline routing and airport conditions and also include various deposits for communication and reservation services, utilities, and general office equipment and supplies.

Station related equipment cover various aircraft, passenger, and baggage handling equipment located at the station. Terminal facility costs cover ticket counters and passenger seating.

- GENERAL
- DATA SOURCES AND APPLICATION
- DEMAND ANALYSIS
- ON-LINE CONNECTING DEMAND
- 1985 PROFITABILITY FORECAST METHODOLOGY
- FINAL RESULTS

## DETERMINATION OF AIR DEMAND

- General

This section discusses the data sources and techniques used in the development of air travel demand estimates for each city-pair of interest. Populations were developed for 1973, 1976, and 1985 for each community, and combined with intercity distances and available travel demand data to yield demand estimating relationships. Three different equations were developed, depending upon the type and availability of calibration data. The calculations took into account on-line connecting passengers as well as local and inter-line connecting trips.(1) The air demand generated for each city-pair was adjusted to reflect nominal service frequencies, and along with nominal fares, used as inputs to the route network analysis.

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(1) See Glossary for definitions of local, on-line, and inter-line trips.

- Data Sources and Applications

Previous studies in estimating air travel demand indicate that city-pair population products are a required input to any demand estimating technique. A contour of 30 minutes driving time to each candidate community was established as shown in Figure 13. These contours were used as areas that defined the population to be used as a source of air demand. In some cases this definition required adding populations of smaller communities around a large community, and in other cases an entire county was considered as the population source. The basic data sources for the population projections included the Census Bureau statistics for 1960 and 1970 and available forecasts from various state agencies (Refs. 4 through 8). The population data were also supplemented with data from the Rand McNally Atlas (Ref. 9).

Populations were desired for 1973, which corresponded to the latest year in which historical origin and destination (O&D) travel demand data was available from the CAB. Data was also desired for 1976 (a target plan year for commuter service) and for 1985, a forecast year used to examine ultimate viability. Most estimates involved extrapolating or interpolating the available data. In cases where city population forecasts were not available, the ratio of city to county population was computed and used along with county projections to derive the city forecasts. The final population estimates for the service areas of the candidate communities are shown in Table XVI.

Another data input was the O&D data for those city-pairs that had air service in 1973. These city-pairs were developed from the CAB statistics of Ref. 10. Intercity air distances were also derived from this source for city-pairs with current certificable air service. Air distances between other cities were determined from the U.S. Department of Commerce enroute low-altitude flight information publications using the most direct IFR routing. The auto distances, which were needed for some of the travel demand calculations,

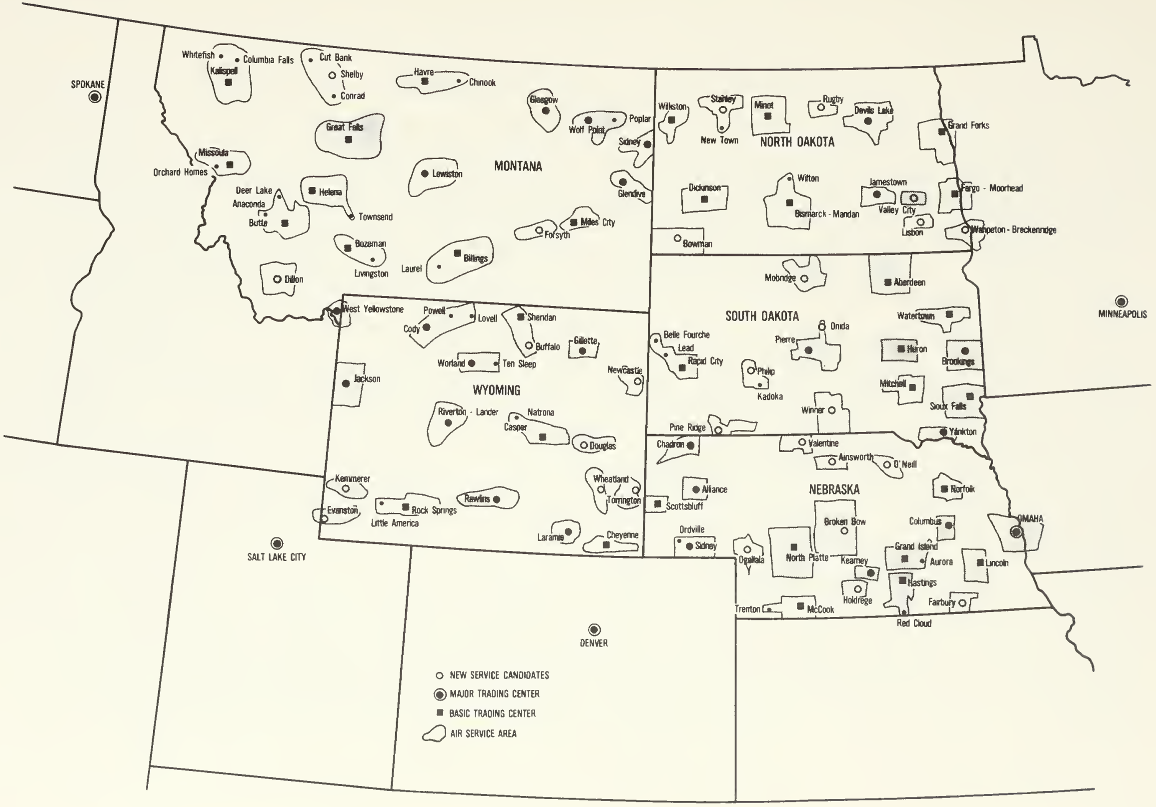


Figure 13. Old West Region Air Service Areas

# TABLE XVI. SERVICE AREA POPULATIONS

| Service Point | Service Area Population (000)[a] | | |
|---|---|---|---|
| | 1973 | 1976 | 1985 |
| MONTANA | | | |
| Billings | 85.83 | 92.43 | 115.82 |
| Bozeman | 30.07 | 33.40 | 47.21 |
| Butte | 54.43 | 57.12 | 63.54 |
| Dillon | 4.54 | 4.27 | 3.54 |
| Forsyth | 2.00 | 2.07 | 2.47 |
| Glasgow | 5.57 | 6.51 | 10.22 |
| Glendive | 8.06 | 7.92 | 7.67 |
| Great Falls | 78.73 | 82.97 | 95.70 |
| Havre | 12.95 | 13.41 | 14.86 |
| Helena | 25.86 | 28.61 | 39.19 |
| Kalispell | 17.70 | 19.10 | 23.10 |
| Lewiston | 6.50 | 6.55 | 6.78 |
| Miles City | 8.70 | 8.55 | 7.88 |
| Missoula | 55.34 | 59.20 | 70.30 |
| Shelby | 10.70 | 10.29 | 9.41 |
| Sidney | 5.47 | 5.47 | 5.57 |
| West Yellowstone | 0.85 | 0.94 | 1.33 |
| Wolf Point | 4.64 | 4.57 | 4.46 |
| NEBRASKA | | | |
| Ainsworth | 3.47 | 3.49 | 3.53 |
| Alliance | 6.78 | 6.68 | 6.60 |
| Broken Bow | 13.37 | 13.13 | 12.40 |
| Chadron | 6.23 | 7.08 | 7.37 |
| Columbus | 16.67 | 17.52 | 20.10 |
| Fairbury | 9.91 | 9.72 | 9.14 |
| Gordon | 3.12 | 3.20 | 3.45 |
| Grand Island | 53.52 | 54.60 | 57.84 |
| Hastings | 31.00 | 31.38 | 32.51 |
| Holdrege | 9.55 | 9.56 | 9.64 |
| Kearney | 20.68 | 22.03 | 25.19 |
| Lincoln | 179.53 | 186.78 | 208.56 |
| McCook | 13.80 | 13.83 | 13.92 |
| Norfolk | 17.74 | 21.90 | 26.30 |
| North Platte | 30.58 | 31.22 | 33.12 |
| Ogallala | 6.77 | 6.99 | 7.66 |
| Omaha | 543.68 | 566.96 | 604.91 |
| O'Neill | 5.96 | 6.16 | 6.77 |
| Scottsbluff | 37.37 | 38.20 | 40.71 |
| Sidney | 10.36 | 10.31 | 10.18 |
| Valentine | 2.74 | 2.79 | 2.95 |
| NORTH DAKOTA | | | |
| Bismarck | 44.86 | 42.23 | 34.34 |
| Bowman | 4.00 | 4.10 | 4.40 |
| Devils Lake | 13.90 | 14.88 | 17.84 |
| Dickinson | 19.90 | 20.19 | 21.05 |
| Fargo | 102.92 | 111.57 | 134.50 |

[a] Approx. 30 minutes driving time contours

## TABLE XVI. SERVICE AREA POPULATIONS (Cont.)

| Service Point | Service Area Population (000)[a] | | |
|---|---|---|---|
| | 1973 | 1976 | 1985 |
| NORTH DAKOTA (Cont.) | | | |
| Grand Forks | 58.18 | 61.67 | 72.14 |
| Jamestown | 15.40 | 15.50 | 15.70 |
| Lisbon | 3.30 | 3.21 | 2.92 |
| Minot | 61.00 | 63.44 | 70.76 |
| Rugby | 3.00 | 3.17 | 3.59 |
| Stanley | 4.86 | 5.04 | 5.69 |
| Valley City | 7.75 | 7.66 | 7.39 |
| Wahpeton | 7.72 | 7.85 | 8.24 |
| Williston | 11.74 | 11.43 | 10.49 |
| SOUTH DAKOTA | | | |
| Aberdeen | 37.95 | 38.98 | 42.07 |
| Brookings | 22.84 | 23.52 | 25.57 |
| Huron | 20.64 | 20.43 | 19.69 |
| Mitchell | 18.15 | 18.37 | 19.03 |
| Mobridge | 7.30 | 7.56 | 8.35 |
| Philip | 1.84 | 1.89 | 2.02 |
| Pierre | 14.15 | 15.22 | 18.42 |
| Rapid City | 86.97 | 91.67 | 105.79 |
| Sioux Falls | 83.63 | 85.45 | 90.93 |
| Watertown | 16.38 | 17.52 | 20.94 |
| Winner | 8.33 | 8.48 | 8.95 |
| Yankton | 13.58 | 13.68 | 13.96 |
| WYOMING | | | |
| Casper | 50.82 | 51.92 | 55.22 |
| Cheyenne | 55.60 | 60.80 | 75.90 |
| Cody | 12.79 | 13.24 | 14.59 |
| Douglas | 4.80 | 5.62 | 7.76 |
| Evanston | 6.10 | 6.27 | 6.53 |
| Gillette | 8.61 | 9.05 | 10.36 |
| Jackson | 2.52 | 2.97 | 4.29 |
| Kemmerer | 2.30 | 2.51 | 2.83 |
| Laramie | 23.60 | 24.10 | 25.70 |
| Newcastle | 3.37 | 3.31 | 3.14 |
| Rawlins | 9.63 | 10.97 | 14.97 |
| Riverton | 16.59 | 17.50 | 20.24 |
| Rock Springs | 19.50 | 23.20 | 34.20 |
| Saratoga | 1.42 | 1.62 | 2.21 |
| Sheridan | 15.08 | 15.92 | 18.43 |
| Torrington | 4.30 | 4.51 | 4.97 |
| Wheatland | 2.60 | 2.73 | 3.07 |
| Worland | 5.20 | 5.40 | 5.80 |
| OTHER STATES | | | |
| Denver, Colorado | 1268.78 | 1432.40 | 1922.90 |
| Boise, Idaho | 113.80 | 116.50 | 124.40 |
| Minneapolis, Minnesota | 1908.80 | 1987.58 | 2226.30 |
| Salt Lake City, Utah | 527.30 | 551.60 | 624.50 |
| Spokane, Washington | 274.00 | 289.00 | 334.00 |

[a] Approx. 30 minutes driving time contours

were generally derived from official Highway Department maps for each state. The states of Nebraska and Wyoming were of special interest, in that total auto demand was available on an intercounty basis and was used in the calculation of air demand. The Wyoming auto data was already available in published form (Ref. 11), while a specially requested computer run was made to develop the Nebraska data (Ref. 12).

In order to obtain normalized demand for the standard air service frequency of interest (two round trips per day), frequency data were developed using the November 1973 Official Airline Guide. A relationship developing current air fare as a function of airline distance was also developed using regional fare data derived from the May 1975 Official Airline Guide. The data and resulting nominal fare equation are shown in Figure 14.

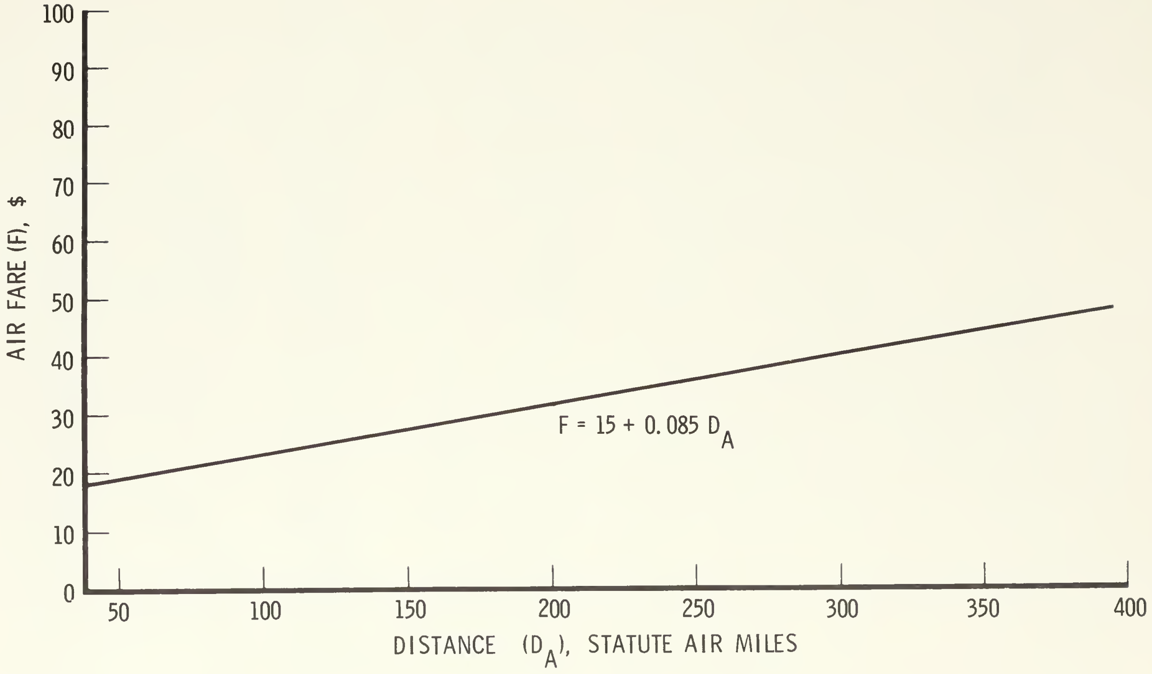


Figure 14. Air Fare Versus Distance (5/1/75)

### Demand Analysis

The first step in the development of demand relationships was to examine the air demand data for 81 city-pairs that were normalized by population product and plotted as a function of air and ground intercity distances. As this data was a mix of both intrastate and interstate demand and involved cities of large differences in population and economic characteristics, the scatter in the data proved to be too large to develop consistent relationships. As an alternative, a subset of 17 city-pairs were chosen that more closely reflected the community characteristics and related travel demands more typical of those which one would expect in commuter air service. The city-pairs and associated normalized air demand data are shown in Table XVII. A least squares procedure was then used to develop demand normalized by population to the 0.55 power as a polynomial function of intercity auto distance for both connecting and total air demand.

The equations that were developed considered three cases: one case where historical air demand data were available, a second case where total travel demand by all modes was available, and the third case, which applied to new service. A discussion of each type follows.

#### (1) Type A

This type involved city-pairs in which the 1973 air travel demand was known and was scaled by population product to develop demand for the forecast years (1976 and 1985). The equation for air demand is given by the following:

$$Y_y = \left[T_{73} + 1.734(2 - f)PP_{73}^{.55}\right]\left(\frac{PP_y}{PP_{73}}\right)^{.55}$$

where

$T_y$ = total air demand (pass./day)

$y$ = year of interest

TABLE XVII. OLD WEST REGION DEMAND CALIBRATION DATA

| City-Pair | $d_G$ | (Pass. /Day)/ Conn.[a] | $(PP)^{.55}$ Total | Frequency (DRT)[b] | Nominal Demand (Pass. /Day)/ $(PP)^{.55}$ Total | Nominal Demand (Pass. /Day)/ $(PP)^{.55}$ Conn.[a] |
|---|---|---|---|---|---|---|
| Lincoln – Omaha | 59 | 2.78 | 3.05 | 5.5 | 2.2 | 2.2 |
| Norfolk – Omaha | 112 | 3.64 | 4.90 | 2.0 | 4.9 | 3.6 |
| Bismarck – Minot | 114 | 4.06 | 5.67 | 4.0 | 2.2 | 3.7 |
| Billings – Bozeman | 139 | 3.17 | 6.82 | 3.5 | 4.2 | 2.9 |
| Grand Isl. – Omaha | 147 | 3.81 | 4.78 | 3.0 | 3.0 | 3.6 |
| Casper – Cheyenne | 190 | 0.28 | 3.33 | 2.0 | 3.3 | 0.3 |
| Minot – Grand Forks | 211 | 1.73 | 5.07 | 2.0 | 5.1 | 1.7 |
| Billings – Great Falls | 219 | 3.43 | 20.20 | 8.0 | 9.8 | 2.5 |
| Kalispell – Great Falls | 228 | 3.13 | 7.63 | 1.0 | 9.4 | 3.3 |
| Aberdeen – Sioux Falls | 234 | 3.55 | 9.22 | 2.0 | 9.2 | 3.6 |
| Billings – Butte | 234 | 1.52 | 4.73 | 3.0 | 3.0 | 1.4 |
| North Platte – Omaha | 281 | 2.89 | 5.04 | 3.0 | 3.3 | 2.7 |
| Billings – Casper | 286 | 2.72 | 7.55 | 3.0 | 5.8 | 2.6 |
| Bismarck – Rapid City | 391 | 1.42 | 5.25 | 1.0 | 7.0 | 1.6 |
| Billings – Bismarck | 418 | 3.05 | 5.53 | 3.0 | 3.8 | 2.9 |
| Scottsbluff – Omaha | 453 | 0.98 | 3.72 | 2.25 | 3.3 | 0.9 |
| Minot – Rapid City | 479 | 0.92 | 3.01 | 1.0 | 4.7 | 1.1 |

[a] Connecting traffic

[b] Daily Round Trips

$f$ = air service frequency in 1973 (round trips/day)

$PP$ = city-pair population product ($\times 10^9$)

The exponent of .55 was developed from prior gravity model studies of low-density service in similar arenas.

(2) Type B

This type involved city-pairs in Nebraska and Wyoming in which the total 1973 O&D travel demand by all modes was known. As the cordon surveys used in developing the data were performed in 1971, the O&D auto demand was scaled up to 1973 by using the ratio of 1973 to 1971 highway traffic volumes appropriate to each city-pair. The air demand is given by the following:

$$T_y = \left[ MS \times D_T + CONN \times PP_{73}^{.55} \right] \left( \frac{PP_y}{PP_{73}} \right)^{.55}$$

where

$MS$ = air modal split fraction

$D_T$ = total O&D demand by all modes

$CONN = 2.66 + 0.001286\ d_G + 0.000213\ d_G^{1.5}$

$d_G$ = intercity auto distance (smi)

The equation for connecting travel demand (CONN) was derived from the data in Table XVII. The air modal split (MS) was derived by a special regression analysis. This analysis used 1973 air modal split where total demand for a set of Nebraska and Wyoming city-pairs was available. Total demand for this purpose was defined as auto O&D plus certificated air local O&D traffic. The modal split was adjusted to reflect nominal commuter air service conditions at 1975 fare levels. Nominal conditions were defined as two daily non-stop round trips with small aircraft at 1975 fare levels. The 1973 air modal splits were adjusted on the basis of demand sensitivities developed from modal split simulations. The data set of Old West city-pairs, adjusted air modal split, and ground distance is shown in Table XVIII.

A regression fit specifying air modal split as a quadratic function of ground distance was obtained. The resulting commuter air modal split equation resulted in very small negative air modal splits for short distances. A linear approximation of the quadratic was derived and is as follows:

| Ground Distance | | 0 to 60 Statue Miles: |
|---|---|---|
| Air Modal Split<br>(in percent) | = | 0 |

| Ground Distance | | 61 to 300 Statute Miles: |
|---|---|---|
| Air Modal Split<br>(in percent) | = | $-0.829 + 0.013817 \times d_G$ |

(3) Type C

This set involved new service to communities with no prior air service history and for which total travel demand data were not available. An expression was derived from the data in Table XVII. It includes both the connecting and local air demand and is expressed by the following:

$$T_y = \left[-2.724 + 0.09256\, d_G - 0.0036\, d_G^{1.5}\right] PP_y^{.55}$$

The effects of higher auto costs and air fares on short haul air demand were investigated. In current dollars, short haul (0 to 300 miles) air fares in the Old West Region increased an average of 31 percent between 1973 and 1975. Similarly, out of pocket auto costs increased 24 to 40 percent. As the increase in auto costs was about the same range as the increase in air fares, no further adjustment was made to the 1976 air demand.

TABLE XVIII. OLD WEST REGION AIR MODAL SPLIT DATA

| City Pair | Adjusted Air Modal Split (%) | Ground Distance (smi) |
|---|---|---|
| Casper — Sheridan | 2.5 | 153 |
| Casper — Cheyenne | 1.6 | 190 |
| Cheyenne — Laramie | 0.01 | 50 |
| Riverton — Rock Springs | 0.22 | 142 |
| Columbus — Omaha | 0.05 | 84 |
| Grand Island — Omaha | 0.56 | 147 |
| Lincoln — Omaha | 0.02 | 59 |
| Norfolk — Omaha | 0.62 | 112 |
| N. Platte — Omaha | 2.5 | 281 |

- On-Line Connecting Demand

The demand relationships established thus far considered only the local and inter-line connecting O&D passengers as recorded in the CAB statistics (Ref. 9). In any replacement service, however, one must include the additional demand component of on-line or through-plane passengers. This traffic includes passengers who originate at some outlying city on a certificated carrier (and thus are on-line) and connect at (or pass through) the connecting city. When such certificated service is replaced on a given city-pair with commuter air service, the traffic demand that would be available to the commuter carrier is more than the CAB on-line O&D. In order to estimate the total traffic available to a commuter carrier, a traffic flow analysis was required of the CAB O&D data for each city-pair.

The demand data used as a basis for this analysis was the CAB On-Line Origin and Destination data for CY 1973. The traffic demand available to a commuter carrier is composed of both the local demand and the total connecting traffic. For example, a commuter replacement in the Riverton-Casper market would serve the local Riverton-Casper O&D market, the interline connecting traffic included as Riverton-Casper connecting passengers in the CAB O&D data, and the Frontier on-line connecting or through traffic originating or terminating at Riverton. In the CAB O&D data, this on-line connecting traffic is shown as O&D for other city-pairs. Thus, the traffic shown in the CAB data as Frontier on-line O&D from Riverton to Denver would become Riverton-Casper connecting traffic for a commuter. The demand estimates for individual city-pairs therefore required a significant amount of statistical reclassification. The resulting demand summary is shown in Table XVII for all Type A city-pairs.

It should be pointed out that the on-line connecting traffic allocated to any given city-pair is network dependent. For example, in the Basic Network strategy the 1973 on-line connecting traffic for the Casper-Riverton city-pair was 27.3 passengers/day. For the Subregional Collector strategy the traffic allocated via the Riverton-Laramie city-pair (Denver-Riverton traffic of 12.4 passengers/day) had to be re-routed via Casper because there was no Laramie-Riverton service in this network. Therefore, the 1973 on-line connecting traffic for Casper-Riverton in the Subregional Collector Network was 39.7 passengers/day.

Now that a connecting factor had been developed for each of the Type A city-pairs, an overall weighted average of these (1.88) was used to multiply the demands computed for Type B and C city-pairs to account for on-line connecting traffic. This average was applied to all such city-pairs in the Basic Network. A region-wide connect factor of 2.3 was similarly derived for the total Old West Region for use on Type B and C city-pairs of the Subregional Collector Network. This connecting factor of 2.3 was the weighted average connecting factor of the city-pairs in Table XIX and the additional Type A city-pairs used in the Subregional Collector Network shown in Table XX. This latter connecting factor was slightly higher than that for the Basic Network as fewer routes are contained in the Subregional Collector Network to serve on-line connecting demand.

## TABLE XIX. OLD WEST REGION TYPE A CITY-PAIR DEMAND DATA--BASIC NETWORK

(Daily Passengers--Calendar Year 1973)

| City Pair | On-Line O&D | On-Line Connecting | Total Traffic | Connecting Factor[a] |
|---|---|---|---|---|
| Aberdeen — Bismarck | 5.5 | 3.2 | 8.7 | 1.58 |
| Aberdeen — Minot | 1.9 | 0 | 1.9 | 1.0 |
| Aberdeen — Sioux Falls | 17.4 | 19.4 | 36.8 | 2.11 |
| Billings — Cody | 2.3 | 0.7 | 3.0 | 1.30 |
| Billings — Jackson | 7.8 | 0.9 | 8.7 | 1.11 |
| Billings — Miles City | 1.6 | 2.0 | 3.6 | 2.25 |
| Billings — Sheridan | 4.5 | 0.4 | 4.9 | 1.09 |
| Bismarck — Minot | 9.9 | 8.9 | 18.8 | 1.90 |
| Bismarck — Rapid City | 11.1 | 7.5 | 18.6 | 1.67 |
| Bismarck — Sioux Falls | 10.8 | 10.5 | 21.3 | 1.97 |
| Brookings — Fargo | 0.7 | 1.8 | 2.5 | 3.57 |
| Casper — Riverton | 1.2 | 27.3 | 28.5 | 23.75 |
| Casper — Salt Lake City | 18.1 | 39.7 | 57.8 | 3.19 |
| Casper — Sheridan | 1.8 | 54.8 | 56.6 | 31.44 |
| Casper — Worland | 0.3 | 15.6 | 15.9 | 53.0 |
| Cheyenne — Denver | 82.7 | 44.0 | 126.7 | 1.53 |
| Columbus — Omaha | 2.4 | 2.0 | 4.4 | 1.83 |
| Denver — Jackson | 43.5 | 8.9 | 52.4 | 1.20 |
| Denver — McCook | 9.0 | 1.3 | 10.3 | 1.14 |
| Devils Lake — Grand Forks | 0.9 | 6.7 | 7.6 | 8.44 |
| Fargo — Watertown | 0.9 | 0.6 | 1.5 | 1.67 |
| Grand Island — Omaha | 30.5 | 18.2 | 48.7 | 1.60 |
| Great Falls — Havre | 1.3 | 0.7 | 2.0 | 1.54 |
| Great Falls — Helena | 2.7 | 0 | 2.7 | 1.0 |
| Great Falls — Kalispell | 9.2 | 0 | 9.2 | 1.0 |
| Great Falls — Lewistown | 0.6 | 1.0 | 1.6 | 2.67 |
| Great Falls — Missoula | 4.2 | 15.8 | 20.0 | 4.76 |
| Huron — Sioux Falls | 4.0 | 16.5 | 20.5 | 5.13 |
| Jackson — Salt Lake City | 45.9 | 1.0 | 46.9 | 1.02 |
| Kalispell — Spokane | 21.9 | 37.5 | 59.4 | 2.71 |
| Laramie — Riverton | 1.8 | 12.2 | 14.0 | 7.78 |
| Minot — Rapid City | 7.5 | 2.9 | 10.4 | 1.39 |
| Minot — Williston | 4.7 | 1.0 | 5.7 | 1.21 |
| Mitchell — Sioux Falls | 3.3 | 11.0 | 14.3 | 4.33 |
| Norfolk — Omaha | 17.0 | 2.0 | 19.0 | 1.18 |
| Norfolk — Sioux Falls | 1.1 | 4.9 | 6.0 | 5.45 |
| Riverton — Worland | 0.1 | 0 | 0.1 | 1.0 |
| Rock Springs — Worland | 0.1 | 3.4 | 3.5 | 35.0 |
| Sioux Falls — Watertown | 4.0 | 6.2 | 10.2 | 2.55 |
| Sioux Falls — Yankton | 2.6 | 10.0 | 12.6 | 4.85 |
| Brookings — Sioux Falls | 2.3 | 7.0 | 9.3 | 4.65 |

[a] Ratio of total traffic to on-line O&D traffic

## TABLE XX. ADDITIONAL OLD WEST TYPE A CITY-PAIRS--SUBREGIONAL COLLECTOR NETWORK

(Daily Two-Way Passengers--Calendar Year 1973)

| City-Pair | On-Line O&D | On-Line Connecting | Total Traffic | Connecting Factor[a] |
|---|---|---|---|---|
| Alliance — Scottsbluff | 0.1 | 5.3 | 5.4 | 54.0 |
| Billings — Bozeman | 9.8 | 110.0 | 119.8 | 12.22 |
| Billings — Butte | 11.0 | 30.1 | 41.1 | 3.74 |
| Billings — Helena | 24.8 | 78.9 | 103.7 | 4.18 |
| Billings — Lewistown | 1.2 | 1.9 | 3.1 | 2.58 |
| Billings — Sidney | 1.5 | 2.5 | 4.0 | 2.67 |
| Butte — Spokane | 21.2 | 29.6 | 50.8 | 2.40 |
| Casper — Cody | 0.7 | 18.8 | 19.5 | 27.86 |
| Casper — Rock Springs | 1.7 | 1.4 | 3.1 | 1.82 |
| Chadron — Scottsbluff | 0.1 | 10.9 | 11.0 | 110.00 |
| Denver — Kearny | 13.2 | 2.5 | 15.7 | 1.19 |
| Denver — Laramie | 31.3 | 8.0 | 39.3 | 1.26 |
| Fargo — Grand Forks | 9.7 | 14.7 | 24.4 | 2.51 |
| Hastings — Omaha | 19.7 | 3.7 | 23.4 | 1.19 |
| Kearny — Omaha | 8.7 | 4.1 | 12.8 | 1.47 |
| McCook — Omaha | 5.3 | 1.9 | 7.2 | 1.36 |

[a] Ratio of total traffic to on-line O&D traffic

- 1985 Profitability Forecast

The route analysis of the recommended system (discussed in the "Recommended Commuter System" section) provided estimates of profitability for each route, based on the expected 1976 demands. In order to estimate what the increased profitability of the entire system would be in 1985, the normalized 1976 and 1985 demands were used to compute the percent change in demand for each city-pair in 1985. These percentages were then multiplied by the 1976 demands on each non-stop route to yield the increase in passengers per day. For the one-stop and multi-stop routes, a conservative estimate was used in that it was assumed that the demands at the intermediate stops did not change. Of the 52 routes studied, 42 routes showed an increase in demand, five routes had no change, and the remaining five routes actually showed a decrease in demand. The net effect when summed for the entire system was an increase of 96.5 passengers per day or a net percentage increase of 10.2 percent.

The equations for profitability were then examined to determine the effect of this demand increase on the profit for each route. The only terms in the equations that were functions of demand were the revenue, and the revenue mile and passenger terms in the IOC equation. Thus, the change in profitability for each route could be expressed as follows:

$$\Delta P = K_1 [K_2 \times F - (C_2 \times DIST + C_3)] \Delta D \qquad (1)$$

where

$\Delta P$ = change in annual profit (in $000)

$\Delta D$ = change in demand (pass./day)

$F$ = one-way fare ($)

$DIST$ = airway distance (smi)

$K_1$ = 0.365 = conversion factor from $/day to $000/yr

$K_2$ = 0.926 = conversion factor from fare to revenue (deducts 8% federal tax)

$C_2 = 0.004392$ = coefficient of RPM factor in IOC equation

$C_3 = 2.38$ = coefficient of passenger factor in IOC equation

Substituting coefficients and conversion factors and combining terms, Equation (1) becomes

$$\Delta P = (0.338F - 0.0016\ DIST - 0.8687)\Delta D \qquad (2)$$

Equation (2) was applied to each route of the recommended network, using actual values of fare, airway distance, and projected changes in demand. (Results are shown in Tables L and LI.)

- Final Results

The final city-pair nominal air travel demands for each network are listed in Appendices 1 through 4, together with a format description of the column headings. A sample partial list for the Subregional Collector Network is shown in Table XXI. These fares and demands are nominal values, normalized to a service frequency of two round trips per day and reflecting current fare structures. They were used as basic inputs to the route analysis for each network and were modified in subsequent iterations to satisfy economic optimization objectives and route coupling constraints. The actual demands forecast for each route appear in the output of the computerized route analyses, also contained in Appendices 1 through 4.

It should be noted in Table XXI that the column labeled "Type" designates the particular demand equation used to compute the nominal demand for a given city-pair. A few city-pairs also bear a special designation R or S to indicate that they required revised or special modification. The R was used for all city-pairs involving Aberdeen to indicate that the CAB O&D data for 1973 did not account for two months in which the airport was closed, and thus required an appropriate correction in computing daily passengers. The S was used to indicate special modification for one of the following reasons:

- Modified (or eliminated) on-line connecting traffic, because of alternate allocation to other cities (e.g., Fairbury-Lincoln and Ainsworth-Norfolk).

- Reduced demand because of extremely one-sided population products (e.g., Denver-Ogallala and Denver-Saratoga).

- Reduced demand because of required plane changes (e.g., Bismarck-Rugby and Norfolk-Valentine).

## TABLE XXI. OLD WEST SUBREGIONAL COLLECTOR NETWORK NOMINAL FARE AND DEMAND

(Sample--for complete listing, see Appendix 2)

| | OLD WEST | | NETWORK | | NOMINAL DEMAND | | |
|---|---|---|---|---|---|---|---|
| CITY | PAIR | TYPE | NO. | DIST. | FARE | 76DEMAND | 85DEMAND |
| ABERDEEN | MOBRIDGE | C | 46 | 101 | $24 | 3.2 | 3.7 |
| ABERDEEN | SIOUX FAL | AR | 70 | 145 | $27 | 42.5 | 43.7 |
| ~~AINSWORTH~~ | ~~OMAHA~~ | ~~B~~ | ~~116~~ | ~~245~~ | ~~$36~~ | ~~8.3~~ | ~~8.7~~ |
| AINSWORTH | NORFOLK | BS | 27 | 130 | $27 | 1.2 | 1.3 |
| ALLIANCE | SCOTTSBLF | A | 17 | 57 | $18 | 6.3 | 6.5 |
| ~~BILLINGS~~ | ~~BUTTE~~ | ~~A~~ | ~~99~~ | ~~191~~ | ~~$31~~ | ~~39.6~~ | ~~47.6~~ |
| BILLINGS | CODY | A | 59 | 84 | $22 | 3.9 | 4.6 |
| BILLINGS | DILLON | C | 123 | 196 | $32 | 8.7 | 9.0 |
| ~~BILLINGS~~ | ~~FORSYTH~~ | ~~C~~ | ~~13~~ | ~~111~~ | ~~$24~~ | ~~2.5~~ | ~~3.2~~ |
| BILLINGS | GLASGOW | C | 127 | 188 | $31 | 10.8 | 15.6 |
| BILLINGS | GLENDIVE | C | 11 | 209 | $33 | 11.5 | 12.6 |
| ~~BILLINGS~~ | ~~LEWISTON~~ | ~~A~~ | ~~102~~ | ~~101~~ | ~~$24~~ | ~~4.6~~ | ~~5.3~~ |
| BILLINGS | MILES CTY | A | 12 | 134 | $26 | 5.2 | 5.7 |
| BILLINGS | SHERIDAN | A | 60 | 101 | $24 | 7.4 | 9.1 |
| ~~BILLINGS~~ | ~~SIDNEY~~ | ~~A~~ | ~~10~~ | ~~265~~ | ~~$38~~ | ~~8.3~~ | ~~9.4~~ |
| BILLINGS | WOLF PT. | C | 128 | 249 | $36 | 9.0 | 10.2 |
| BISMARCK | BOWMAN | C | 35 | 144 | $27 | 4.4 | 4.1 |
| ~~BISMARCK~~ | ~~DICKINSON~~ | ~~C~~ | ~~34~~ | ~~106~~ | ~~$24~~ | ~~6.0~~ | ~~5.3~~ |
| BISMARCK | MINOT | A | 72 | 87 | $22 | 12.6 | 12.0 |
| BISMARCK | RUGBY | C | 131 | 164 | $29 | 1.5 | 1.4 |
| ~~BISMARCK~~ | ~~STANLEY~~ | ~~C~~ | ~~132~~ | ~~162~~ | ~~$29~~ | 2.1 | 2.1 |
| BISMARCK | WILLISTON | C | 30 | 193 | $31 | 9.2 | 7.8 |
| BROKENBOW | OMAHA | B | 117 | 193 | 31 | 21.4 | 21.6 |
| ~~BROOKING~~ | ~~SIOUX FAL~~ | ~~A~~ | ~~133~~ | ~~46~~ | ~~$19~~ | ~~9.6~~ | ~~10.4~~ |
| BUTTE | DILLON | C | 90 | 48 | $19 | 1.1 | 1.1 |
| BUTTE | MISSOULA | CS | 125 | 107 | $24 | 53.7 | 61.7 |
| ~~CASPER~~ | ~~CODY~~ | ~~A~~ | ~~110~~ | ~~201~~ | ~~$32~~ | ~~21.6~~ | ~~23.6~~ |
| CASPER | DOUGLAS | B | 63 | 61 | $20 | 3.5 | 4.4 |
| CASPER | GILLETTE | B | 112 | 103 | $24 | 9.4 | 10.3 |
| ~~CASPER~~ | ~~RAWLINS~~ | ~~B~~ | ~~113~~ | ~~97~~ | ~~$23~~ | ~~12.2~~ | ~~14.9~~ |
| CASPER | RIVERTON | A | 93 | 101 | $24 | 42.6 | 47.7 |
| CASPER | ROCK SPR | A | 114 | 160 | $29 | 5.4 | 6.9 |
| ~~CASPER~~ | ~~SARATOGA~~ | ~~B~~ | ~~115~~ | ~~113~~ | ~~$25~~ | ~~3.2~~ | ~~3.7~~ |
| CASPER | SHERIDAN | A | 94 | 131 | $23 | 60.6 | 67.7 |
| CASPER | WORLAND | A | 95 | 122 | $25 | 17.4 | 18.7 |
| ~~CHADRON~~ | ~~SCOTTSBLF~~ | ~~A~~ | ~~15~~ | ~~47~~ | ~~$19~~ | ~~12.0~~ | ~~12.7~~ |
| CHEYENNE | TORRINGTN | B | 67 | 69 | $21 | 3.5 | 4.1 |
| CHEYENNE | WHEATLAND | B | 66 | 58 | $20 | 3.0 | 3.7 |
| ~~COLUMBUS~~ | ~~OMAHA~~ | ~~A~~ | ~~76~~ | ~~81~~ | ~~$22~~ | ~~4.6~~ | ~~5.2~~ |
| DENVER | LARAMIE | A | 104 | 115 | $25 | 24.3 | 29.6 |
| DENVER | MCCOOK | A | 22 | 224 | $34 | 10.0 | 13.0 |
| ~~DENVER~~ | ~~SARATOGA~~ | ~~CS~~ | ~~136~~ | ~~165~~ | ~~$29~~ | ~~1.7~~ | ~~2.1~~ |
| DEVILS LK | FARGO | C | 38 | 164 | $29 | 15.2 | 18.6 |
| EVANSTON | SALT LAKE | B | 53 | 65 | $20 | 15.9 | 17.5 |

- GENERAL
- ROUTE ANALYSIS
- DEMAND SENSITIVITIES
- PROFITABILITY ANALYSIS
- ROUTE COUPLING
- SEASONALITY ANALYSIS
- SUMMARY RESULTS

## ROUTE STRUCTURE ANALYSIS

- General

The analysis approach used to define specific routes, aircraft, and service characteristics to best serve the candidate communities in the alternative air service strategies is summarized in Figure 15. Certain route specifications were established to match city-pairs initially, minimize stops, and provide minimum service frequencies. Based upon nominal travel demands, city-pairs were matched, aircraft were selected, service characteristics were defined, and the economics of service was determined. Iterations of this process were then performed using varied fares, aircraft block times, and service frequencies to best match route segments from the standpoint of travel demand; aircraft size, utilization, and load factors; service frequencies; and economic viability. This processes is defined in more detail in the following paragraphs.

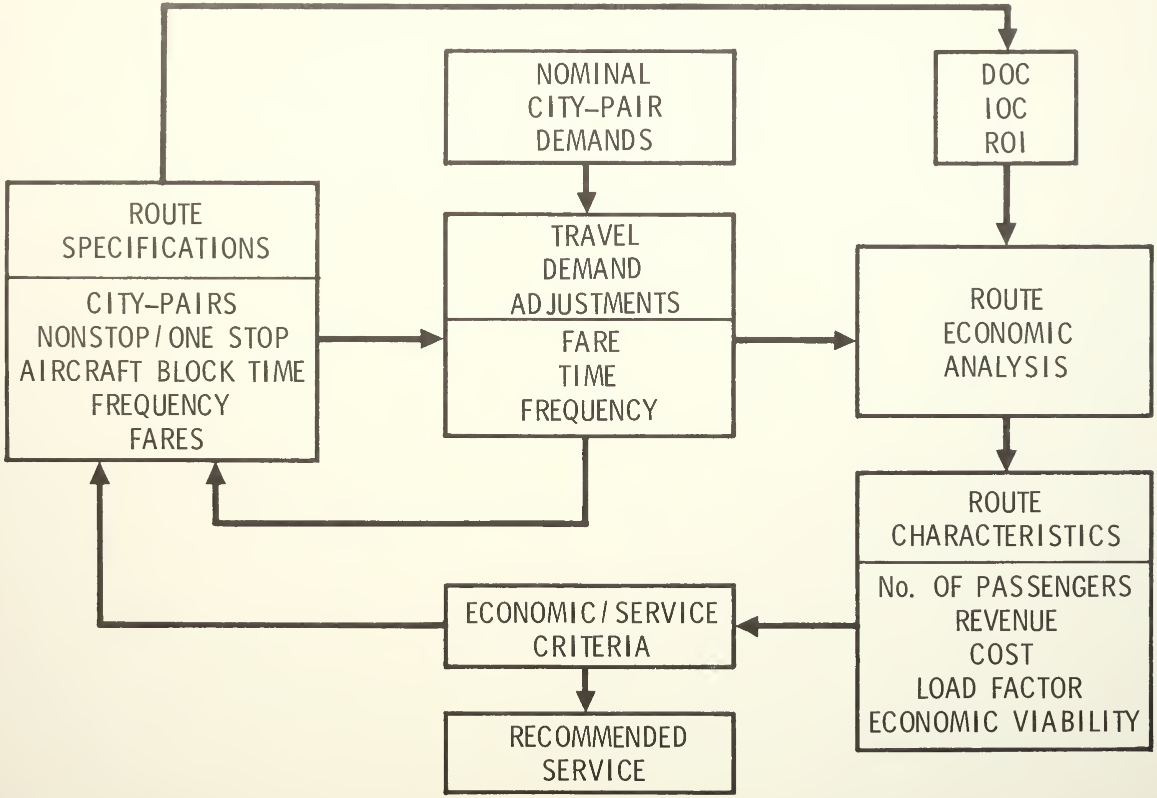


Figure 15. Route Analysis Approach

- Route Analysis

The same economic analysis was used for the evaluation of each of the alternative air service strategies. This economic analysis sought to determine for each route the best economic configuration (greatest profit or minimum loss) consistent with realistic air service conditions. Individual routes were revised as necessary to achieve realistic route system structures. The final estimates of economic viability for each route are thus consistent with the route structure system as a whole.

The economic viability definition used to produce the route structures was based on passenger revenue at least equal to operating cost. As discussed in the "Commuter Aircraft and Airline Economics" section, operating costs are composed of direct (DOC) and indirect (IOC) cost elements and a return on investment (ROI) allowance. The DOC and ROI costs were based on an annual utilization of 2500 block hours per aircraft, which is representative of typical utilization of commuter aircraft in similar markets.

The system route structures were evaluated initially for a set of individual routes. These routes were generated in the manner outlined below and then examined for economic viability.

The initial activity was to examine the 1976 city-pair nominal demand levels. The 1976 city-pair nominal air travel demands (discussed in the "Determination of Air Demand" section) were used as the demand level consistent with the nominal service condition of two daily-round-trip non-stop flights and a fare structure of $15 + $.085/mile. These data were examined to identify those city-pairs with air demand that equalled or exceeded the minimum level for viable, non-stop service. This level was 16 daily passengers, equatable to a 50 percent load factor for an eight-passenger aircraft operating two daily round trips. The minimum frequency level of two daily round trips was selected based on commuter airline recommendations and experience in the Western states.

The eight-passenger aircraft was found to be the smallest-size economically viable aircraft; the sensitivity of air travel demand to fare levels indicated that an eight-passenger aircraft with a slightly lower fare is nearly always more economical than a five-seat aircraft with a slightly lower fare. The cost difference between five-seat and eight-seat aircraft is slight. Table IX shows that an aircraft of similar speed (Turbo-Aztec E) to the eight-passenger aircraft (Cessna 402B) has only a five percent lower DOC and ROI per block hour. Thus, only a small utilization of the additional capacity of the larger aircraft will make the eight-passenger aircraft more economically attractive. Initial route analysis results (which included the five-passenger aircraft) produced a geographically scattered pattern of five-passenger aircraft routes. In order to permit better aircraft utilization and to realize the cost savings due to commonality, the five-passenger aircraft were replaced by eight-passenger aircraft.

City-pairs of less than the 16 passenger per day nominal demand level were examined in conjunction with each other and with the previously determined routes for city-pairs of 16 or more daily passengers. Routes were selected on the basis of the following guidelines and considerations.

- As one-stop service on a 100-mile city-pair results in only about a 30-minute time advantage over driving, service to city-pairs of less than this 100-mile distance was designed to be non-stop. Markets with the small time advantage were found, both empirically and from the modal split simulations, to have a negligible air modal split and O&D air demand. For example, the Old West city-pair, Cheyenne-Laramie, with an air distance of 46 miles, had a 1973 O&D demand of only 0.1 daily passengers from a total demand of 1,369 daily passengers (Refs. 13 and 14).

- Maximum average annual route segment load factors of 65 percent were used to allow for variations in time-of-day and day-of-week demand to be accommodated without excessive turnaway of passengers at peak demand times. The effects of seasonal variations in demand on the maximum average annual load factor were separately considered.

- One-stop and two-stop routes were selected to combine city-pairs that minimized route circuity. That is, the ideal one-stop would be a straight line route. Such a route was the minimum cost one-stop route and also minimized the degradation of demand for the city-pair receiving the one-stop service.

- City-pairs were combined on multi-segment routes where possible to approximate equal on-board demand for each segment.

On each route, the initial frequency level examined was the minimum one of two daily round trips with an eight-passenger aircraft. The travel demand for each city-pair on the route was then obtained for the appropriate fare, frequency level, block time (non-stop or one-stop), and aircraft (for which block time varied from the nominal) by using demand sensitivities to modify the nominal demand. For those city-pairs that were served by more than one route, the demand was allocated to individual routes on the basis of frequency, aircraft capacity, and total passenger trip time. Fares for each city-pair were varied in an attempt to balance demand, by using the demand sensitivity relationships, and to maximize revenue on each segment of multi-segment routes. If the route was viable and the demand exceeded the 65 percent load factor, increased frequency and larger aircraft were tried next. If the route was nonviable, alternative routes, if possible, were evaluated, including two-stop routes.

- Demand Sensitivities

The Aerospace Corporation modal split simulation was used to estimate the sensitivity of air travel demand to varied fares, service frequencies, and trip time. This model predicts the allocation of travel demand among competing transportation modes on the basis of the relative cost, time, and frequency attributes of each mode. A number of modal split simulations were made. Typical Old West Region communities were abstractly modeled for traveler income, trip purpose, and party size. Two modes were modeled--commuter air service and auto. The commuter air service characteristics of fare, frequency, and trip time (one-stop versus non-stop service) were individually varied to determine the change in the air modal split percentage. The changes in the air modal split percentages were the basis for the demand sensitivites shown in the following tables.

Table XXII shows the fare sensitivity demand factors. The demand factors are the multipliers of the nominal city-pair demand levels that were used to compute city-pair demand levels for specific routes and fares. As an example, if a fare increase of 10 percent above the nominal fare were assumed, the actual demand would be 86 percent of the original nominal demand. The frequency sensitivities shown in Table XXIII were derived from empirical demand/frequency data for certificated airline service on fifteen city-pairs in the Old West Region. The demand levels for the fifteen city-pairs were normalized to compute frequency demand factors and their unweighted average, which provided the frequency demand factors for frequency levels of two, three, four, and five daily round trips. The frequency demand factors for the frequency levels of six, seven, and eight daily round trips were derived by judgmental extrapolation.

The demand factors for one-stop service are shown in Table XXIV. These demand factor multipliers are based on an additional one-half hour trip time because of the inclusion of an intermediate stop on a non-stop route. An examination of the demand factors in Table XXIV shows that the demand

## TABLE XXII. OLD WEST REGION FARE SENSITIVITY DEMAND FACTORS

| Fare Level | | Demand Factor |
|---|---|---|
| Nominal Fare | | 1.0 |
| Nominal Fare | Plus 10% | 0.86 |
| Nominal Fare | Plus 20% | 0.73 |
| Nominal Fare | Plus 30% | 0.60 |
| Nominal Fare | Minus 10% | 1.37 |
| Nominal Fare | Minus 20% | 1.74 |
| Nominal Fare | Minus 30% | 2.11 |

## TABLE XXIII. OLD WEST REGION FREQUENCY SENSITIVITY DEMAND FACTORS

| Frequency Level | Demand Factor |
|---|---|
| 2 Daily Round Trips (Nominal Level) | 1.0 |
| 3 Daily Round Trips | 1.35 |
| 4 Daily Round Trips | 1.70 |
| 5 Daily Round Trips | 2.05 |
| 6 Daily Round Trips | 2.30 |
| 7 Daily Round Trips | 2.50 |
| 8 Daily Round Trips | 2.60 |

TABLE XXIV. OLD WEST REGION ONE-STOP SENSITIVITY DEMAND FACTORS

| Air Distance (Miles) | One-Stop versus Non-Stop Demand Factor |
|---|---|
| 50 | 0.42 |
| 100 | 0.65 |
| 150 | 0.61 |
| 200 | 0.70 |
| 250 | 0.76 |
| 300 | 0.79 |

TABLE XXV. OLD WEST REGION TRIP TIME SENSITIVITY DEMAND FACTORS

| Air Distance (Miles) | Trip Time[a] Demand Factor |
|---|---|
| 250 | 0.87 |
| 300 | 0.86 |
| 350 | 0.85 |
| 400 | 0.84 |

[a] Eight-passenger aircraft trip time versus nominal trip time

levels on shorter distance city-pairs (50 to 150 miles) are more sensitive to one-stop versus non-stop service than the demand on longer distance city-pairs.

The nominal travel demands were based on trip times for non-stop service with a representative commuter aircraft. This aircraft was the fifteen-passenger Beech 99. For routes that used a slower aircraft trip time, demand adjustments were required. These sensitivities were computed from the variations of air modal split percentages with increase in aircraft trip time. The differences in trip time for the eight-passenger aircraft (Cessna 402B) versus the fifteen-passenger aircraft were computed. Significant differences in trip time were found only for the longer ranges. The differences in trip time for the longer ranges were combined with the trip time sensitivities to produce the demand factors shown in Table XXV.

The demand sensitivity factors shown in Tables XXII through XXV were used to calculate the travel demand adjustments as shown in the central block of the Route Analysis Approach flow diagram (Figure 15).

- Profitability Analysis

The equations used for profitability analysis are given below. They permit the calculation of the economic viability of any given route.

The computation of revenues, costs, and operating profit for each route involved the use of these equations. Annual revenue was determined by first computing the revenue for each city-pair. City-pair revenue was determined by multiplying daily passengers for each city-pair times the fare for that city-pair. It is necessary to subtract the eight percent federal ticket tax (dividing by 1.08), which is included in the fare but is not part of the airline revenue, and to convert revenues from a daily to an annual basis (multiply by 365). Total route revenue was the sum of the city-pair, or route segment, revenues. The equation for annual revenue (REV) is

$$\mathrm{REV} = \mathrm{REV}_1 + \mathrm{REV}_2 + \text{etc.}$$

$$\mathrm{REV}_1 = (\mathrm{PASS}_1) \times (\mathrm{FARE}_1) \times 365 \div 1.08$$

$$\mathrm{REV}_2 = (\mathrm{PASS}_2) \times (\mathrm{FARE}_2) \times 365 \div 1.08$$

where

$\mathrm{PASS}_1$ = passengers for city-pair No. 1

$\mathrm{PASS}_2$ = passengers for city-pair No. 2

$\mathrm{FARE}_1$ = fare for city-pair No. 1

$\mathrm{FARE}_2$ = fare for city-pair No. 2

[e.g., on the Subregional Collector Network Billings-Butte route (see Appendix 2), Revenue = 52.6 × \$35 ÷ 1.08 = \$622,200]. It should be noted that no additional revenue from nonpassenger sources was considered as the operator will undoubtedly offer fare discounts under certain conditions. Such discounts normally offset the nonpassenger revenues typically realized from such sources as freight and mail. Total operating costs were the sum of DOC, ROI, and IOC. The calculation of DOC for a route depended directly on block time.

Block time was computed using the aircraft performance data given in Table IX. Total daily block time (BT) for a route was computed from

$$BT = FREQ \times 2 \times (0.117 \times DEP + TPM \times DIST)$$

where

BT = block time per day in hours
FREQ = daily round trips
TPM = time per mile (in hours)
Eight-passenger aircraft = 0.00486 hr/mi
Fifteen-passenger aircraft = 0.00376 hr/mi
DIST = sum of route segment airway distances. For example, for Subregional Collector route No. 301 (Broken Bow-Columbus-Omaha), the route segment distances are Broken Bow-Columbus: 112 miles; Columbus-Omaha: 81 miles; total DIST for this route = 193 miles.
DEP = departures per flight, which is equal to the number of cities on a route minus one. Therefore, DEP = 1 for non-stop routes and 2 for one-stop routes.

Block time is multiplied by DOC/block hour as

$$DOC = BT \times DOC/HR$$

DOC = direct operating cost per day
DOC/HR = direct operating cost per hour
Eight-passenger aircraft = $66.59/hr
Fifteen-passenger aircraft = $151.62/hr

(e.g., for the Subregional Collector Network Billings-Butte route, DOC = 3.56 × \$151.62 = \$539.77). IOCs were computed using the commuter airline IOC formulation identified in the "Commuter Aircraft and Airline Economics" section as follows:

$$IOC = \$2.38 \times PASS + \$0.004392 \times RPM + \$0.013876 \times ASM + \$13.58 \times TDEP$$

where

IOC = daily IOC for the route

PASS = sum of daily city-pair passengers on the route

RPM = revenue passenger miles--computed as follows: PASS × Airway distance, where for multi-segment routes the airway distance for city-pairs with one- or two-stop service is the sum of the route segment distance over which that city-pair's passengers are routed. For example, Broken Bow-Omaha passengers on the route Broken Bow-Columbus-Omaha have an airway distance, for computing RPMs, of the sum of the Broken Bow-Columbus segment distance and the Columbus-Omaha segment distance.

ASM = available seat miles computed by FREQ × 2 × Aircraft capacity (seats) × DIST (as computed in the BT equation shown above)

TDEP= daily departures equal to DEP (calculated in the BT equation above) × FREQ × 2

[e.g., for the Subregional Collector Network Billings-Butte route, IOC = \$2.38 (52.6) + 0.004392 (52.6) (126) + 0.013876 (3) (2) (15) (126) + 13.58 (1) (3) (2) = \$393.13].

To account for the nonoperating cost of interest, income taxes, and airline retained earnings, an ROI allowance is added. The equation for the daily route ROI is

$$ROI = BT\ (ROI/HR)$$

where ROI is the annual allowance for 12.35 percent ROI for the route; ROI/HR is ROI cost per hour for 12.35 percent ROI: eight-passenger aircraft = \$7.82/hr, and fifteen-passenger aircraft = \$26.12/hr (e.g., for the Billings-Butte route ROI = 3.56 (26.12) = \$92.99/day × 365 = \$33,900/yr).

Total operating cost is the sum of DOC, ROI, and IOC. The equation is

$$TOC = 365 \times (DOC + IOC + ROI)$$

TOC = annual total operating cost for the route

[e.g., for the entire route, TOC = 365 (\$539.77 + \$393.13 + \$92.99) = \$373,400].

Operating profit or loss was defined as revenue less operating cost where operating cost includes DOC, IOC, and ROI:

$$OP = REV - TOC$$

where OP is the annual operating profit or loss.

For example, for the Subregional Collector Network Billings-Butte route,

$$OP = \$622,200 - \$373,400 = \$248,800$$

The revenue, cost, and profit equations were used in a computerized route analysis program to compute economic and operating statistics for each route. The route analysis program's output format and definitions for non-stop routes are shown in Table XXVI. An output sample for non-stop routes for the Subregional Collector Network is shown in Table XXVII.

For one-stop routes additional data items are calculated and output by the route analysis program. A sample route from the Subregional Collector Network, Route No. 301: Broken Bow-Columbus-Omaha, is shown in Table XVIII. In addition to the data items defined in Table XXVI for non-stop routes, additional data items are calculated and output only for one-stop routes. These data items are defined in Table XXIX.

# TABLE XXVI. OLD WEST REGION ROUTE ANALYSIS PROGRAM OUTPUT--NON-STOP ROUTES

| Route Name (City-Pair) | RT. No. | DIST. | Revenue (000) | Cost (000) | P/L $(000) | Loss Ratio | A/C CAP | Freq. DRT | No. A/C | PLF | Pass/ Day | Fare (OW) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

Route Name = Name of city-pair route--routes are arranged alphabetically

RT. No. = Route number used for identification and route map applications

DIST. = Airway distance in statute miles

Revenue = Annual route revenue in thousands of dollars

Cost = Route annual direct and indirect operating cost (including a 12.35% annual return on investment unless otherwise indicated) in thousands of dollars

P/L = Annual route profit or loss in thousands of dollars

Loss Ratio = Loss (required subsidy) divided by revenue

A/C CAP = Aircraft passenger capacity

Freq. (DRT) = Service frequency in daily round trips

No. A/C = Fraction of aircraft required on route based upon 2500 block hours of annual utilization

PLF = Passenger load factor (average of total route)

Pass/Day = Number of two-way daily passengers between communities

Fare = One-way (OW) fare related to noted passenger demand

## TABLE XXVII. FINAL SUBREGIONAL COLLECTOR CONCEPT

| ROUTE (CITY-PAIR) | RT. NO. | DIST | REVENUE (000) | COST (000) | P/L (000) | LOSS RATIO | A/C CAP | FREQ DRT | NO. A/C | PLF | PASS/ DAY | FARE (OW) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ABERDEEN-BISMARCK | 224 | 148 | 139.2 | 150.3 | -11.1 | .08 | 8 | 2 | .49 | .56 | 17.9 | 23 |
| ABERDEEN-SIOUX FALLS | 228 | 145 | 490.8 | 390.3 | 100.5 |  | 15 | 3 | .58 | .54 | 48.4 | 30 |
| ALLIANCE-SCOTTSBLUFF | 234 | 37 | 56.2 | 68.5 | -12.2 | .22 | 8 | 2 | .17 | .40 | 12.8 | 13 |
| BILLINGS-BUTTE | 212 | 126 | 622.2 | 358.6 | 263.6 |  | 15 | 3 | .52 | .58 | 52.6 | 35 |
| BILLINGS-LEWISTOWN | 215 | 101 | 55.2 | 109.1 | -53.9 | .98 | 8 | 2 | .35 | .30 | 9.6 | 17 |
| BILLINGS-SHERIDAN | 213 | 101 | 81.1 | 111.6 | -30.5 | .38 | 8 | 2 | .35 | .38 | 12.0 | 20 |
| BISMARCK-DICKINSON | 204 | 100 | 71.8 | 111.4 | -39.6 | .55 | 8 | 2 | .35 | .39 | 12.5 | 17 |
| BISMARCK-PIERRE | 209 | 266 | 134.9 | 226.3 | -91.4 | .68 | 8 | 2 | .82 | .42 | 13.3 | 30 |
| BISMARCK-WILLISTON | 222 | 193 | 139.9 | 181.7 | -41.7 | .30 | 8 | 2 | .62 | .56 | 18.0 | 23 |
| BROKEN BOW-N. PLATTE | 237 | 65 | 62.4 | 87.2 | -24.8 | .40 | 8 | 2 | .25 | .38 | 12.3 | 15 |
| BROOKINGS-SIOUX FALLS | 206 | 50 | 85.7 | 81.3 | 4.4 |  | 8 | 2 | .21 | .53 | 16.9 | 15 |
| BUTTE-MISSOULA | 214 | 107 | 828.6 | 540.5 | 288.1 |  | 15 | 5 | .76 | .61 | 90.8 | 27 |
| CASPER-GILLETTE | 217 | 103 | 112.0 | 120.7 | -8.7 | .08 | 8 | 2 | .36 | .61 | 19.5 | 17 |
| CASPER-RIVERTON | 210 | 101 | 446.4 | 309.1 | 137.4 |  | 15 | 3 | .44 | .56 | 50.8 | 26 |
| CASPER-ROCK SPRINGS | 219 | 160 | 77.4 | 150.8 | -73.4 | .95 | 8 | 2 | .52 | .34 | 10.9 | 21 |
| CASPER-SHERIDAN | 205 | 131 | 958.2 | 736.2 | 222.0 |  | 15 | 6 | 1.07 | .56 | 105.0 | 27 |
| CHEYENNE-TORRINGTON | 207 | 69 | 36.5 | 85.0 | -48.4 | 1.33 | 8 | 2 | .26 | .22 | 7.2 | 15 |
| CHEYENNE-WHEATLAND | 208 | 58 | 29.8 | 76.6 | -46.8 | 1.57 | 8 | 2 | .23 | .20 | 6.3 | 14 |
| DENVER-LARAMIE | 221 | 115 | 94.6 | 64.8 | 29.8 |  | 8 | 1 | .20 | .63 | 10.0 | 28 |
| DENVER-MC COOK | 238 | 224 | 160.2 | 200.5 | -40.3 | .25 | 8 | 2 | .70 | .49 | 15.8 | 30 |
| FARGO-GRAND FORKS | 223 | 75 | 138.7 | 98.8 | 39.9 |  | 8 | 2 | .28 | .53 | 17.1 | 24 |
| FARGO-JAMESTOWN | 225 | 87 | 85.6 | 104.9 | -19.3 | .23 | 8 | 2 | .32 | .47 | 14.9 | 17 |
| GREAT FALLS-HAVRE | 201 | 107 | 46.5 | 111.6 | -65.1 | 1.40 | 8 | 2 | .37 | .25 | 8.1 | 17 |
| GREAT FALLS-KALISPELL | 202 | 139 | 163.1 | 245.1 | -82.0 | .50 | 15 | 2 | .37 | .42 | 25.4 | 19 |
| GREAT FALLS-SHELBY | 211 | 89 | 55.7 | 101.6 | -45.9 | .82 | 8 | 2 | .32 | .32 | 10.3 | 16 |
| HASTINGS-OMAHA | 218 | 141 | 203.0 | 145.8 | 57.2 |  | 8 | 2 | .47 | .57 | 18.2 | 33 |
| HURON-SIOUX FALLS | 229 | 79 | 153.2 | 105.1 | 48.1 |  | 8 | 2 | .29 | .64 | 20.6 | 22 |
| KALISPELL-SPOKANE | 203 | 167 | 1372.5 | 882.5 | 490.0 |  | 15 | 6 | 1.31 | .63 | 112.8 | 36 |
| LINCOLN-PIERRE | 216 | 351 | 194.7 | 286.3 | -91.6 | .47 | 8 | 2 | 1.06 | .45 | 14.4 | 40 |
| MINNEAPOLIS-WATERTOWN | 220 | 193 | 528.6 | 478.8 | 49.8 |  | 15 | 3 | .74 | .51 | 46.0 | 34 |
| NORFOLK-OMAHA | 239 | 102 | 331.0 | 241.9 | 89.1 |  | 8 | 4 | .72 | .64 | 40.8 | 24 |
| SIOUX FALLS-WATERTOWN | 230 | 78 | 108.9 | 101.7 | 7.2 |  | 8 | 2 | .29 | .56 | 17.9 | 18 |
| SIOUX FALLS-YANKTON | 231 | 48 | 102.3 | 80.7 | 21.5 |  | 8 | 2 | .20 | .56 | 17.8 | 17 |

# TABLE XXVIII. FINAL SUBREGIONAL COLLECTOR NETWORK

*ORIGIN AND DESTINATION*

| *CITY-PAIR* | *2-WAY DAILY PASS. (1)* | *DISTANCE (S. MI.) (2)* | *ONE-WAY FARE* |
|---|---|---|---|
| *BROKEN BOW-COLUMBUS* | .0 | 112 | .00 |
| *COLUMBUS-OMAHA* | 4.6 | 81 | 22.00 |
| *BROKEN BOW-OMAHA* | 12.3 | | 35.00 |

*SEGMENT DATA*

| *SEGMENT* | *ON-BOARD PASS.* | *LOAD FACTOR* |
|---|---|---|
| *BROKEN BOW-COLUMBUS* | 12.3 | .38 |
| *COLUMBUS-OMAHA* | 16.9 | .53 |

*ROUTE DATA*

| | |
|---|---|
| *ANNUAL* | |
| *REVENUE* (000) | 179.7 |
| *OPER. COST*(000) | 211.5 |
| *PROFIT/LOSS*(000) | -31.8 |
| *BLOCK_TIME*(*DAILY HR*) | 4.7 |
| *FREQUENCY*(*DRT*) | 2 |
| *AIRCRAFT_SIZE* | 8 |
| *NO_OF_AIRCRAFT*(3) | .68 |
| *AVG_LOAD_FACTOR* | .44 |
| *LOSS_RATIO* | .177 |

(1) *ON THIS ROUTE*
(2) *AIRWAY DISTANCE*
(3) *BASED ON 2500 HR YEARLY*

TABLE XXIX. OLD WEST REGION ROUTE ANALYSIS PROGRAM OUTPUT--ONE-STOP ROUTES

| | |
|---|---|
| Segment Data: | Data calculated for each city-pair segment of a route by combining the city pair traffic on each segment. |
| On-Board Pass.: | The total passengers on-board the aircraft over the segment. For example, on the sample route Broken Bow-Columbus-Omaha the on-board passengers for the segment Columbus-Omaha (16.9 passengers) are the sum of the O&D passengers for Columbus-Omaha (4.6) and Broken Bow-Omaha (12.3). |
| Load Factor: | The on-board segment load factor which is determined by dividing on-board passengers by daily segment aircraft capacity. |
| Block Time: | The daily block hours for the total route including all segments. |

- Route Coupling

The route structure network reflects schedule patterns and associated economics based on an assumed annual utilization level of 2500 hours per aircraft. A route coupling analysis was completed for the selected route networks to assign specific aircraft to each route and attempt to optimize utilization. The results of the route coupling analysis led to revised aircraft selections on certain routes to enhance aircraft utilization.

The route coupling analysis involved both quantitative and qualitative constraints. The principal scheduling guidelines and objectives were as follows:

- o Prime time-of-day scheduling objective was morning inbound flights to hub airports (e.g., Denver ) from outlying smaller communities.
- o Secondary time-of-day scheduling objective was evening outbound flights from hub airports to outlying communities.
- o Overnighting of aircraft in outlying communities.
- o Overlapping of ground times at hub airports was scheduled to permit aircraft switching for enhanced reliability and rotation of individual aircraft from high-utilization to low-utilization routes.
- o Scheduling objectives were given priority, and aircraft and route assignments based on initial route structure analysis were revised to facilitate scheduling (e.g., from the route coupling analysis of the Subregional Collector Network, the Great Falls-Kalispell route was changed to utilize a fifteen-passenger rather than an eight-passenger aircraft).

- Assumed aircraft turnaround times were 30 minutes at major hub airports (e. g., Omaha) and 15 minutes at all other communities.

The route coupling results for the recommended communter air service system are discussed in the "Recommended Commuter System" section.

- Seasonality Analysis

The detailed results of the route analysis for the Basic Network and Subregional Collector Concepts presented in Appendices 1 and 2 were based on adjustment of fare, frequency, and aircraft capacity so as not to exceed an average annual aircraft load factor of 65 percent. This load factor took into account the daily, weekly, and average seasonal demand variations to ensure that the demand would rarely exceed the actual aircraft capacity. In order to more precisely account for seasonal variations, it was also considered necessary to account for such variations so as not to exceed a 75 percent maximum peak season load factor.

Data was available from the CAB 1973 O&D traffic statistics for Type A city-pairs giving information on a quarterly basis (Ref. 14), which permitted the calculation of a Seasonality Index, defined as

$$\text{Index} = \frac{Q_{\text{Max}}}{T_{\text{Annual}}/4}$$

where

$Q_{\text{Max}}$ = Person trips in the peak quarter (inbound + outbound)

$T_{\text{Annual}}$ = Annual person trips

Thus, the Seasonality Index is the ratio of the peak quarterly traffic to the average quarterly traffic. For those routes that had high average annual load factors, O&D data by city-pair was collected and the Seasonality Index was computed. The product of the index and the load factor was computed for each route and checked against a 75 percent maximum allowable peak season load factor. Where the 75 percent criteria was exceeded, the fare was adjusted to reduce city-pair demands appropriately. Table XXX shows the data and resulting Seasonality Index for Type A city-pairs with

## TABLE XXX. OLD WEST REGION SEASONALITY DATA--TYPE A CITY-PAIRS

| City-Pairs | 1973 Trips (Inbound plus Outbound) × $10^{-1}$ | | | | | Seasonality Index | Peak Qtr. |
|---|---|---|---|---|---|---|---|
| | $Q_1$ | $Q_2$ | $Q_3$ | $Q_4$ | $T_{Annual}$ | | |
| Fargo — Grand Forks | 25 | 18 | 37 | 31 | 111 | 1.33 | $Q_3$ |
| Minot — Williston | 31 | 35 | 49 | 55 | 170 | 1.29 | $Q_4$ |
| Mitchell — Sioux Falls | 19 | 30 | 27 | 46 | 122 | 1.51 | $Q_4$ |
| Chadron — Scottsbluff | 60 | 119 | 84 | 80 | 343 | 1.39 | $Q_2$ |
| Aberdeen — Sioux Falls | 169 | 161 | 88 | 218 | 636 | 1.36 | $Q_4$ |
| Bismarck — Rapid City | 97 | 127 | 89 | 91 | 404 | 1.26 | $Q_2$ |
| Denver — Jackson | 172 | 290 | 962 | 164 | 1588 | 2.42[a] | $Q_3$ |
| Casper — Riverton | 195 | 268 | 343 | 270 | 1076 | 1.28 | $Q_3$ |
| Casper — Worland | 73 | 94 | 139 | 101 | 407 | 1.37 | $Q_3$ |
| Bismarck — Minot | 77 | 60 | 90 | 133 | 360 | 1.48 | $Q_4$ |
| Bismarck — Sioux Falls | 79 | 90 | 111 | 114 | 394 | 1.16 | $Q_4$ |
| Butte — Missoula | 49 | 54 | 74 | 71 | 248 | 1.19 | $Q_3$ |

[a] Adjusted for frequency change to 1.61

high load factors. For Type B and C city-pairs, an average Seasonality Index of 1.22 was used. This figure was derived from additional CAB data involving Seasonality Indices computed for 81 major city-pairs within the Old West Region.

The routes that were modified as a result of the seasonality analysis are listed below.

Basic Network

Aberdeen-Sioux Falls
Bismarck-Rapid City
Denver-Jackson
Jackson-Salt Lake City
Bismarck-Aberdeen-Sioux Falls
Bismarck-Minot-Williston
Casper-Riverton-Worland
Sioux Falls-Mitchell-Winner

Subregional Collector Network

Aberdeen-Sioux Falls
Casper-Riverton
Fargo-Grand Forks
Bismarck-Minot-Williston
Pine Ridge-Chadron-Scottsbluff
Sioux Falls-Mitchell-Winner

The route listings shown in Appendices 1 and 2 show the final seasonality revised demand and route data. The Denver-Jackson route in the Basic Network proved to be a special case since it involved an extremely high Seasonality Index. For demand estimation, a weighted average annual demand frequency sensitivity factor was derived. A seasonal frequency of

12 daily round trips for peak season (third quarter) was combined with four to six daily round trips for off-season (first, second, and fourth quarters) to yield a composite average factor of six daily round trips. The peak season aircraft utilization would be 10.3 hours per day for this route if all of the peak season frequencies were provided by aircraft on the Denver-Jackson route. However, this route can be combined with the Jackson-Salt Lake City route such that the resulting peak season aircraft utilization would be a more reasonable figure of 9.3 hours per day.

- Summary Results

The summary results of the analysis of the Basic Network and Subregional Collector Concepts are shown on Tables XXXI and XXXII. They summarize the routes that are estimated to be profitable, that have a subsidy ratio of less than one (i.e., the subsidy need per person is less than the fare paid), and that have subsidy ratios between one and two, and greater than two. Also shown are the number of persons served per day in each route category, annual net profit or loss data, and the profit or cost per person.

The analysis of the Basic Network Concept showed a potential profit of almost $2 million, whereas a subsidy need for those routes with subsidy ratios of less than one is about $1 million. It should also be noted that the cost per person of serving routes with subsidy ratios greater than one increases significantly. The Subregional Collector Concept shows profits of approximately $1.5 million and attendant costs of $.9 million. However, the higher profitability of the Basic Network Concept is principally because of an assumed replacement by commuter air service on selected, high-volume certificated airline routes (e.g., Denver-Jackson, Casper-Salt Lake, and Rapid City-Bismarck). Even though the Subregional Collector Concept also includes replacement service on certain currently served routes, it is expected that certificated air carrier agreement for commuter replacement on the above-mentioned Basic Network routes would be extremely difficult to obtain.

## TABLE XXXI. BASIC NETWORK SERVICE CONCEPT--ECONOMIC SUMMARY

| Route Category | No. Routes | Persons Served Per Day | Annual Net Profit (Loss)[a] ($000) | Profit (Cost) Per Person ($) |
|---|---|---|---|---|
| Profitable | | | | |
| Montana | 1 | 53 | 84.2 | 4.35 |
| Nebraska | 2 | 49 | 49.1 | 2.74 |
| North Dakota | 1 | 30 | 7.8 | 0.71 |
| South Dakota | 3 | 107 | 196.0 | 5.02 |
| Wyoming | 2 | 124 | 196.1 | 4.33 |
| Interstate | 6 | 539 | 1,425.5 | 7.24 |
| Total | 15 | 902 | 1,958.7 | 5.95 |
| Subsidy Ratio Less than One | | | | |
| Montana | 4 | 62 | (208.3) | (9.20) |
| Nebraska | 4 | 42 | (155.8) | (10.16) |
| North Dakota | 4 | 48 | (143.8) | (8.21) |
| South Dakota | 1 | 20 | (37.5) | (5.14) |
| Wyoming | 3 | 88 | (51.0) | (1.59) |
| Interstate | 9 | 167 | (463.5) | (7.60) |
| Total | 25 | 427 | (1,059.9) | (6.80) |
| Subsidy Ratio Between One and Two | | | | |
| Montana | 4 | 31 | (259.3) | (22.92) |
| Nebraska | 2 | 18 | (193.3) | (29.42) |
| North Dakota | 1 | 7 | (99.7) | (39.02) |
| South Dakota | 0 | 0 | 0 | 0 |
| Wyoming | 5 | 26 | (266.2) | (28.05) |
| Interstate | 1 | 7 | (54.9) | (21.49) |
| Total | 13 | 89 | (873.4) | (26.89) |
| Subsidy Ratio Greater than Two | | | | |
| Montana | 1 | 3 | (52.7) | (48.13) |
| Nebraska | 3 | 6 | (184.3) | (84.15) |
| North Dakota | 6 | 10 | (343.0) | (93.97) |
| South Dakota | 3 | 9 | (196.4) | (59.79) |
| Wyoming | 1 | 4 | (58.3) | (39.93) |
| Interstate | 3 | 17 | (720.6) | (116.13) |
| Total | 17 | 49 | (1,555.3) | (86.96) |

[a] Includes 12.35% average annual return on investment

## TABLE XXXII. SUBREGIONAL COLLECTOR SERVICE CONCEPT--ECONOMIC SUMMARY

| Route Category | No. Routes | Persons Served Per Day | Annual Net Profit (Loss)[a] ($000) | Profit (Cost) Per Person ($) |
|---|---|---|---|---|
| Profitable | | | | |
| Montana | 2 | 107 | 347.9 | 8.91 |
| Nebraska | 2 | 59 | 136.2 | 6.32 |
| North Dakota | 1 | 20 | 44.7 | 6.12 |
| South Dakota | 5 | 131 | 179.1 | 3.74 |
| Wyoming | 2 | 156 | 329.7 | 5.79 |
| Interstate | 2 | 123 | 481.0 | 10.71 |
| Total | 14 | 596 | 1,518.6 | 6.98 |
| Subsidy Ratio Less than One | | | | |
| Montana | 6 | 72 | (206.9) | (7.87) |
| Nebraska | 7 | 90 | (253.9) | (7.72) |
| North Dakota | 4 | 60 | (64.1) | (2.93) |
| South Dakota | 1 | 23 | (13.6) | (1.62) |
| Wyoming | 4 | 68 | (210.3) | (8.47) |
| Interstate | 5 | 79 | (167.0) | (5.79) |
| Total | 27 | 392 | (915.8) | (6.40) |
| Subsidy Ratio Between One and Two | | | | |
| Montana | 2 | 18 | (149.5) | (22.75) |
| Nebraska | 1 | 6 | (39.0) | (17.80) |
| North Dakota | 2 | 13 | (134.6) | (28.37) |
| South Dakota | 0 | 0 | 0 | 0 |
| Wyoming | 3 | 19 | (123.7) | (17.84) |
| Interstate | 2 | 11 | (96.1) | (23.93) |
| Total | 10 | 67 | (542.9) | (22.20) |
| Subsidy Ratio Greater than Two | | | | |
| Montana | 0 | 0 | 0 | 0 |
| Nebraska | 0 | 0 | 0 | 0 |
| North Dakota | 2 | 3 | (139.8) | (127.67) |
| South Dakota | 1 | 3 | (68.3) | (62.37) |
| Wyoming | 0 | 0 | 0 | 0 |
| Interstate | 0 | 0 | 0 | 0 |
| Total | 3 | 6 | (208.1) | (95.02) |

[a] Includes 12.35% average annual return on investment

- AIRPORT CRITERIA
- AIRPORT ANALYSIS

# AIRPORT REQUIREMENTS

- Airport Criteria

Criteria were developed for assessing the adequacy of airport facilities available at the candidate air service communities. These criteria addressed minimum airport requirements for reliably supporting commuter air service as well as separate criteria for collector airport candidates.

Commuter airport minimum criteria are identified in Table XXXIII. Considered were such features as runway lengths, marginal weather landing aids, lighting, and terminal facilities. Collector airport criteria are shown in Table XXXIV and were oriented toward adequacy of collector airport candidates to accommodate certificated air service using Boeing 737 and DC-9 jet aircraft.

## TABLE XXXIII. COMMUTER AIRPORT MINIMUM CRITERIA

### Runway

Dimensions should be adequate to meet FAR 135/SFAR 23 requirements for aircraft under consideration. Airport runway should be paved with a length at least adequate to meet FAR 135/SFAR 23 dry runway takeoff and landing requirements at airport altitude. These lengths are for an aircraft sized to the expected demand at a 75% load factor with fuel sufficient to fly under IFR rules to its next destination. Load limiting to be considered for marginal cases.

### Approach Aids

- Electronic Aids: IFR capability required. Ideally, a system that will provide a 90% completion factor in view of weather considerations is desired. However, for those airports that do not currently have a capability, it is assumed that a non-directional beacon will be sufficient. Trained weather observer and equipment required.

- Lighting: Medium intensity runway lights, obstruction lights, and rotating beacon.

### Terminal and Services

- Maintenance: Minor maintenance and appropriate fuel for aircraft are desirable.

- Aircraft Ramp: Paved to gate position, with paved walkway to terminal; fencing optional depending on traffic at airport.

- Terminal: 700 sq ft mobile office with waiting room, ticket desk, restrooms, private and public telephone, heat, and light. Furnishings: Chairs for waiting passengers.

## TABLE XXXIV. COLLECTOR AIRPORT MINIMUM CRITERIA

### Runway

Dimensions should be adequate to meet FAR 121 and FAR 25 balanced field requirements for Boeing 737 and DC-9 aircraft. Airport runway lengths shall be adequate to meet dry runway balanced field requirements at airport altitude at a 75% load factor with fuel sufficient to fly typical short-haul stage length under IFR rules. Load limiting to be considered for marginal cases.

### Approach Aids

- Electronic Aids: Precision IFR approach capability required. Trained weather observer and equipment required.
- Lighting: High intensity runway lights, obstruction lights, and rotating beacon.

### Terminal and Services

- Maintenance: Minor maintenance and appropriate fuel for aircraft desirable.
- Terminal: Permanent airline terminal with waiting room, airline ticket desks, restrooms, private and public telephones, heat, light, food service, baggage handling facilities, etc.

### Other

Certified to FAR Part 139 standards, anti-hijacking security provisions, and appropriate parking and access roads.

- Airport Analysis

Each candidate airport in the region was then examined and selected characteristics identified as shown on Tables XXXV through XXXIX. These features included airport evaluation, runway length, lighting, landing aids, fuel avilability, and the avilability of terminal facilities.

To assess runway length adequacy, the balanced field length requirements (or other limiting runway length parameter) for the commuter and certificated aircraft being considered were examined. Figures 16 and 17 identify the DC-9 and Boeing 737 field length requirements at different runway elevations under both maximum load and 75 percent load factor conditions at two different temperatures. Superimposed on these figures are the runway length and elevation characteristics of the eight subregional collector airports. As can be seen from the figures, no difficulties would be anticipated in operations from these airports except for Bismarck, Rapid City, Scottsbluff, and Casper under maximum load conditions on very hot days. As appropriate off-loading techniques can be readily used when these conditions are present, no problems are anticipated. No major airport needs were identified in the other criteria categories for the collector airport candidates.

Commuter aircraft runway requirements were similarly examined as shown in Figures 18 and 19. Runway lengths and elevations at the candidate commuter service points were then compared with these requirements and any major deficiencies or off-loading needs were identified. Table XL identifies these needs as well as other airport improvement needs when the airport characteristics of the original candidate commuter air service communities were compared with the minimum airport criteria. A number of these airports do not currently have instrument flight rule (IFR) approach aids. In such cases, it was assumed that a relatively simple non-directional beacon (NDB) would be adequate. Medium intensity runway lights (MIRL) and, at least, some form of mobile terminal facilities will be required at some

## TABLE XXXV. MONTANA AIRPORT CHARACTERISTICS

| Community | Airport Name | Runaway |  |  | Instrument Approach Aids | Beacon | VASI | Tower | Fuel | Maintenance | Available Terminal Facilities |
|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  | Elevation | Length (ft) | Lights |  |  |  |  |  |  |  |
| Billings | Logan International | 3605 | 8600 | HIRL | ILS[a] | Yes | Yes | Yes | 80/100, J | Yes | Yes |
| Bozeman | Gallatin Field | 4458 | 9000 | MIRL | ILS[a] | Yes | Yes | --- | 80/100, J | Yes | Yes |
| Butte | Bert Mooney-Silver Bow | 5553 | 9000 | MIRL | VOR[a] | Yes | Yes | --- | 80/100, J | Yes | Yes |
| Cut Bank |  | 3854 | 6240 | MIRL | VOR[a] | Yes | Yes | --- | 80/100, J | Yes | --- |
| Dillon |  | 5238 | 4000 | LIRL | VOR[a] | Yes | --- | --- | 80/100 | Yes | --- |
| Forsyth |  | 2728 | 2500 | MIRL | NDB[a] | Yes | --- | --- | 80/100 | --- | --- |
| Glasgow | (International) | 2293 | 6007 | MIRL | VOR[a] | Yes | --- | --- | 80/100 | Yes | Yes |
| Glendive | Dawson Community | 2457 | 5700 | MIRL | NDB[a] | Yes | --- | --- | 80/100, J | Yes | Yes |
| Great Falls | (International) | 3674 | 10,000 | HIRL | ILS[a] | Yes | --- | Yes | 80/100, J | Yes | Yes |
| Havre | (City-County) | 2584 | 5200 | MIRL | VOR[a] | Yes | --- | --- | 80/100, J | Yes | Yes |
| Helena |  | 3873 | 9000 | HIRL | ILS[a] | Yes | Yes | Yes | 80/100, J | Yes | Yes |
| Kalispell | Glacier Park International | 2972 | 8000 | HIRL | ILS[a] | Yes | --- | --- | 80/100, J | Yes | Yes |
| Lewiston | (Municipal) | 4165 | 5630 | MIRL | VOR[a] | Yes | --- | --- | 80/100, J | Yes | Yes |
| Miles City |  | 2628 | 6313 | MIRL | VOR[a] | Yes | Yes | --- | 80/100, J | Yes | Yes |
| Missoula | Johnson-Bell Field | 3201 | 9499 | HIRL | ILS[a] | Yes | --- | Yes | 80/100 | Yes | Yes |
| Shelby |  | 3430 | 3700 | MIRL | NDB[a] | Yes | --- | --- | 80/100 | Yes | --- |
| Sidney | Richland Municipal | 1983 | 5705 | MIRL | NDB[a] | Yes | --- | --- | 80/100 | Yes | Yes |
| West Yellowstone | Yellowstone Apt. | 6644 | 8401 | HIRL | NDB[a] | Yes | --- | --- | 80/100, J | Yes | Yes |
| Wolf Point | (International) | 1985 | 5100 | MIRL | NDB[a] | Yes | --- | --- | 80/100 | --- | Yes |

[a] Published IFR Approach Procedure

# TABLE XXXVI. NEBRASKA AIRPORT CHARACTERISTICS

| Community | Airport Name | Runway |  |  | Instrument Approach Aids | Beacon | VASI | Tower | Fuel | Maintenance | Available Terminal Facilities |
|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  | Elevation | Length (ft) | Lights |  |  |  |  |  |  |  |
| Ainsworth | (Municipal) | 2587 | 7680 | MIRL | VOR[a] | Yes | --- | --- | 80/100 | Yes | Yes |
| Alliance | (Municipal) | 3930 | 9201 | MIRL | VOR[a] | Yes | --- | --- | 80/100, J | Yes | Yes |
| Beatrice | (Municipal) | 1318 | 4400 | MIRL | VOR[a] | Yes | --- | --- | 80/100 | Yes | Yes |
| Broken Bow | (Municipal) | 2538 | [illegible]400 | MIRL | NDB[a] | Yes | --- | --- | 80/100 | Yes | Yes |
| Chadron | (Municipal) | 3295 | 6000 | MIRL | VOR[a] | Yes | --- | --- | 80/100 | Yes | Yes |
| Columbus | (Municipal) | 1443 | 5002 | MIRL | VOR[a] | Yes | --- | --- | 100, J | Yes | Yes |
| Fairbury | (Municipal) | 1479 | 3400 | MIRL | --- | Yes | --- | --- | 100 | Yes | Yes |
| Gordon | (Municipal) | [illegible]549 | 5100 | MIRL | NDB | Yes | --- |  | 80/100 | Yes | Yes |
| Grand Island | (Airpark) | 1846 | 7189 | HIRL | ILS[a] | Yes | Yes | Yes | 80/100, J | Yes | Yes |
| Hastings | (Municipal) | 1954 | 5600 | MIRL | VOR[a] | Yes | Yes | --- | 80/100 | Yes | Yes |
| Holdrege | Brewster Field | 2313 | 4100 | MIRL | NDB[a] | Yes | --- | --- | 100 | Yes | Yes |
| Kearney | (Municipal) | 2130 | 7225 | MIRL | VOR[a] | Yes | Yes |  | 100, J | Yes | Yes |
| Lincoln | (Municipal) | 1198 | 12,900 | HIRL | ILS[a] | Yes | Yes | Yes | 80/100, J | Yes | Yes |
| McCook | (Municipal) | 2579 | 6000 | MIRL | VOR[a] | Yes | --- | --- | 80/100 | Yes | Yes |
| Norfolk | Karl Stefan Memorial | 1571 | [illegible]800 | MIRL | VOR[a] | Yes | Yes | --- | 80/100, J | Yes | Yes |
| North Platte | Lee Bird Field | 2779 | 6600[b] | MIRL | VOR[a] | Yes | Yes | --- | 80/100, J | Yes | Yes |
| Ogallala | Searle Field | 3250 | 4500 | LIRL | NDB[a] | Yes | --- | --- | 80/100, J | Yes | Yes |
| Omaha | Eppley Airfield | 983 | 8501 | HIRL | ILS[a] | Yes | Yes | Yes | 80/100, J | Yes | Yes |
| O Neill | (Municipal) | 2030 | 3500 | MIRL | VORTAC[a] | Yes | --- | --- | 80/100 | Yes | Yes |
| Scottsbluff | (County) | 3965 | 8280 | MIRL | ILS[a] | Yes | Yes | --- | 80/100, J | Yes | Yes |
| Sidney | (Municipal) | 4312 | 6600 | HIRL | VOR[a] | Yes | Yes | --- | 100, J | Yes | Yes |
| Valentine | Miller Field | 2589 | 5000 | MIRL | NDB[a] | Yes | --- | --- | 80/100 | Yes | Yes |

[a] Published IFR Approach Procedure

[b] Includes 700 Overrun

# TABLE XXXVII. NORTH DAKOTA AIRPORT CHARACTERISTICS

| Community | Airport Name | Runway | | | Instrument Approach Aids | Beacon | VASI | Tower | Fuel | Maintenance | Available Terminal Facilities |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Elevation | Length (ft) | Lights | | | | | | | |
| Bismarck-Mandan | (Municipal) | 1677 | 6923 | HIRL | ILS[a] | Yes | --- | Yes | 80/100, J | Yes | Yes |
| Bowman | (Municipal) | 2958 | 4025 | MIRL | --- | Yes | --- | --- | 80/100 | Yes | Yes |
| Devils Lake | (Municipal) | 1454 | 5509 | MIRL | VOR[a] | Yes | --- | --- | 80/100 | Yes | Yes |
| Dickinson | (Municipal) | 2589 | 5399 | MIRL | VOR[a] | Yes | --- | --- | 80/100 | Yes | Yes |
| Fargo-Moorhead | Hector Field | 900 | 9146 | HIRL | ILS[a] | Yes | Yes | Yes | 80/100, J | Yes | Yes |
| Grand Forks | (International) | 844 | 7349 | HIRL | ILS[a] | Yes | Yes | Yes | 80/100, J | Yes | Yes |
| Jamestown | (Municipal) | 1498 | 6500 | HIRL | ILS[a] | Yes | --- | --- | 80/100 | Yes | Yes |
| Lisbon | (Municipal) | 1240 | 3100 | LIRL | --- | Yes | --- | --- | 80/100 | Yes | --- |
| Minot | (International) | 1715 | 7500 | HIRL | ILS[a] | Yes | --- | --- | 80/100, J | Yes | Yes |
| Rugby | (Municipal) | 1547 | 2700 | LIRL | NDB | Yes | --- | --- | 80/100 | Yes | --- |
| Stanley | (Municipal) | 2239 | 3200 | LIRL | --- | Yes | --- | --- | --- | Yes | --- |
| Wahpeton | Breckinridge Wahpeton Intrs. | 966 | 3300 | MIRL | --- | Yes | --- | --- | 80/100 | Yes | Yes |
| Williston | Sloulin Field International | 1957 | 6041 | MIRL | VOR[a] | Yes | Yes | --- | 80/100, J | Yes | Yes |
| Valley City | (Municipal) | 1399 | 3800 | MIRL | --- | Yes | --- | --- | 80/100 | --- | --- |

[a] Published IFR Approach Procedure

# TABLE XXXVIII. SOUTH DAKOTA AIRPORT CHARACTERISTICS

| Community | Airport Name | Runway | | | Instrument Approach Aids | Beacon | VASI | Tower | Fuel | Maintenance | Available Terminal Facilities |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Elevation | Length (ft) | Lights | | | | | | | |
| Aberdeen | (Regional) | 1301 | 6900 | HIRL | ILS[a] | Yes | --- | --- | 80/100, J | Yes | Yes |
| Brookings | (Municipal) | 1637 | 5428 | MIRL | VOR[a] | Yes | --- | --- | 80/100 | Yes | Yes |
| Huron | (Regional) | 1287 | 7200 | HIRL | ILS[a] | Yes | Yes | --- | 80/100, J | Yes | Yes |
| Mitchell | (Municipal) | 1302 | 6705 | MIRL | VOR[a] | Yes | Yes | --- | 80/100, J | Yes | Yes |
| Mobridge | (Municipal) | 1715 | 4400 | MIRL | VOR | Yes | --- | --- | 80/100 | Yes | Yes |
| Philip[b] | (Municipal) | 2210 | 4000 | MIRL | VOR[a] | Yes | Yes | --- | 80/100 | Yes | --- |
| Pierre | (Municipal) | 1742 | 6898 | HIRL | ILS[a] | Yes | Yes | --- | 80/100, J | Yes | Yes |
| Rapid City | (Regional) | 3182 | 7422 | HIRL | ILS[a] | Yes | Yes | Yes | 80/100/115, J | Yes | Yes |
| Sioux Falls | Joe Foss Field | 1428 | 9000 | HIRL | ILS[a] | Yes | Yes | Yes | 80/91/100/115, J | Yes | Yes |
| Watertown | (Municipal) | 1748 | 6900 | HIRL | ILS[a] | Yes | Yes | --- | 80/100 | Yes | Yes |
| Winner[c] | Bob Wiley Field | 2038 | 3900 | MIRL | VOR[a] | Yes | Yes | --- | 80/100 | Yes | Yes |
| Yankton | Chan Gurney Municipal | [illegible] | [illegible] | MIRL | VOR[a] | Yes | --- | --- | 80/100 | Yes | Yes |
| Pine Ridge | Tribe | 3334 | 5200 | MIRL | --- | Yes | --- | --- | --- | --- | --- |

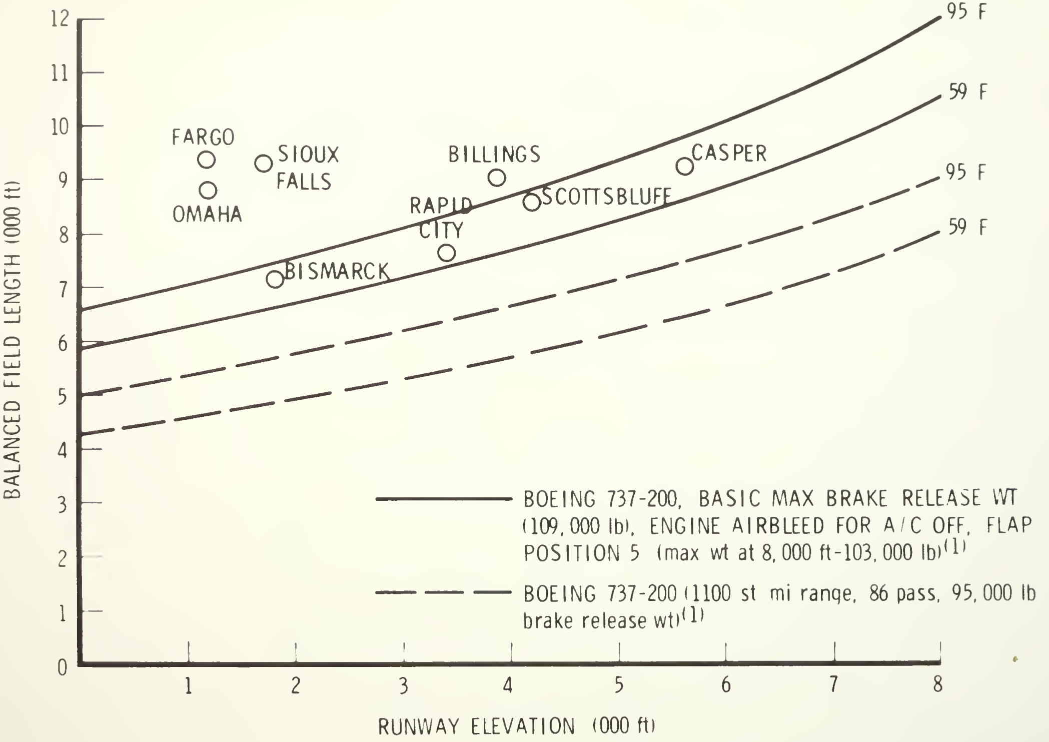
[a] Published IFR Approach Procedure
[b] Proposed 1976 Project
[c] Project Under Grant

## TABLE XXXIX. WYOMING AIRPORT CHARACTERISTICS

| Community | Airport Name | Runway | | | Instrument Approach Aids | Beacon | VASI | Tower | Fuel | Maintenance | Available Terminal Facilities |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Elevation | Length (ft) | Lights | | | | | | | |
| Buffalo | (Municipal) | 4951 | 4500 | MIRL | VOR[a] | Yes | --- | --- | 80/100 | Yes | Yes |
| Casper | Natrona County International | 5348 | 10,672 | HIRL | ILS[a] | Yes | --- | Yes | 80/91/100, J | Yes | Yes |
| Cheyenne | (Municipal) | 6156 | 9199 | HIRL | ILS[a] | Yes | Yes | Yes | 80/115 | Yes | Yes |
| Cody | (Municipal) | 5089 | 7105 | MIRL | VOR[a] | Yes | --- | --- | 80/100, J | Yes | Yes |
| Douglas | Converse County | 4876 | 5066 | MIRL | VOR | Yes | --- | --- | 80/100 | Yes | --- |
| Evanston | (Municipal) | 6600 | 5000 | ---[b] | --- | Yes | --- | --- | 80/100 | Yes | --- |
| Gillette | Campbell County | 4363 | 5500 | MIRL | VOR[a] | Yes | Yes | --- | 80/100, J | Yes | Yes |
| Jackson Hole | Jackson | 6444 | 6305 | MIRL | VOR[a] | Yes | --- | --- | 80/100, J | Yes | Yes |
| Kemmerer | (Municipal) | 7282 | 5550 | --- | --- | --- | --- | --- | --- | --- | --- |
| Laramie | General Brees Field | 7276 | 7700 | MIRL | VOR[a] | Yes | --- | --- | 80/100, J | Yes | Yes |
| Newcastle | Mondell Field | 4166 | 4700 | MIRL | VOR[a] | Yes | --- | --- | 80/100 | Yes | --- |
| Rawlins | (Municipal) | 6784 | 5500 | MIRL | NDB[a] | Yes | --- | --- | 80/100 | Yes | Yes |
| Riverton-Lander | (Municipal) | 5509 | 7621 | MIRL | VOR[a] | Yes | --- | --- | 80/100, J | Yes | Yes |
| Rock Springs | Sweetwater County | 6747 | 6688 | HIRL | ILS[a] | Yes | --- | --- | 80/100, J | Yes | Yes |
| Saratoga | Shively Field | 6978 | 8400 | LIRL | --- | Yes | --- | --- | 80/100, J | --- | Yes |
| Sheridan | (County) | 4021 | 6648 | HIRL | ILS[a] | Yes | Yes | --- | 80/100, J | Yes | Yes |
| Torrington | (Municipal) | 4206 | 5200 | MIRL | --- | Yes | Yes | --- | 80/100 | Yes | --- |
| Wheatland | Phifer Airfield | 4775 | 4124 | MIRL | --- | Yes | --- | --- | 80/100 | --- | --- |
| Worland | (Municipal) | 4245 | 7004 | MIRL | VOR[a] | Yes | --- | --- | 80/100, J | Yes | Yes |

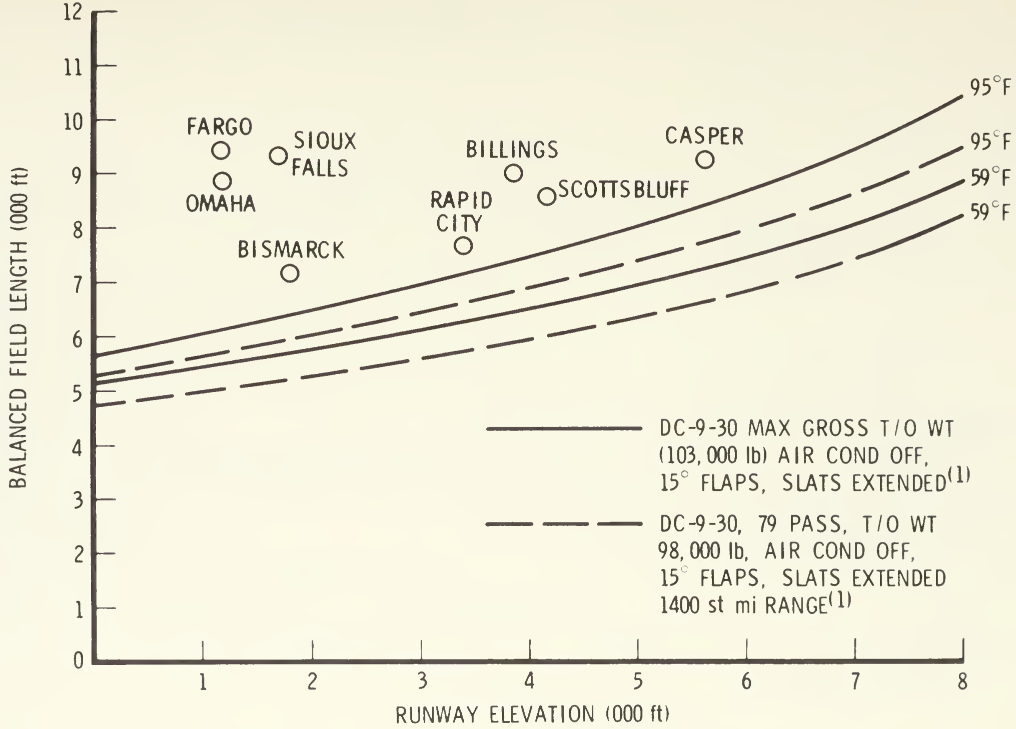
[a] Published IFR Approach Procedure

[b] LIRL on Runway Ends Only



(1) Boeing Doc No. D640077, "Performance of the Boeing Model Advanced 737-200 Jet Transport with JT8D-15 Engines", 2/72

Figure 16. Boeing 737-200 Runway Requirements



[1] McDonnell Douglas Report MDG J5225, "DC-9 Series 30 General Performance Report P&W JT8D-15 Engines", 8/74

Figure 17. Douglas DC-9-30 Runway Requirements

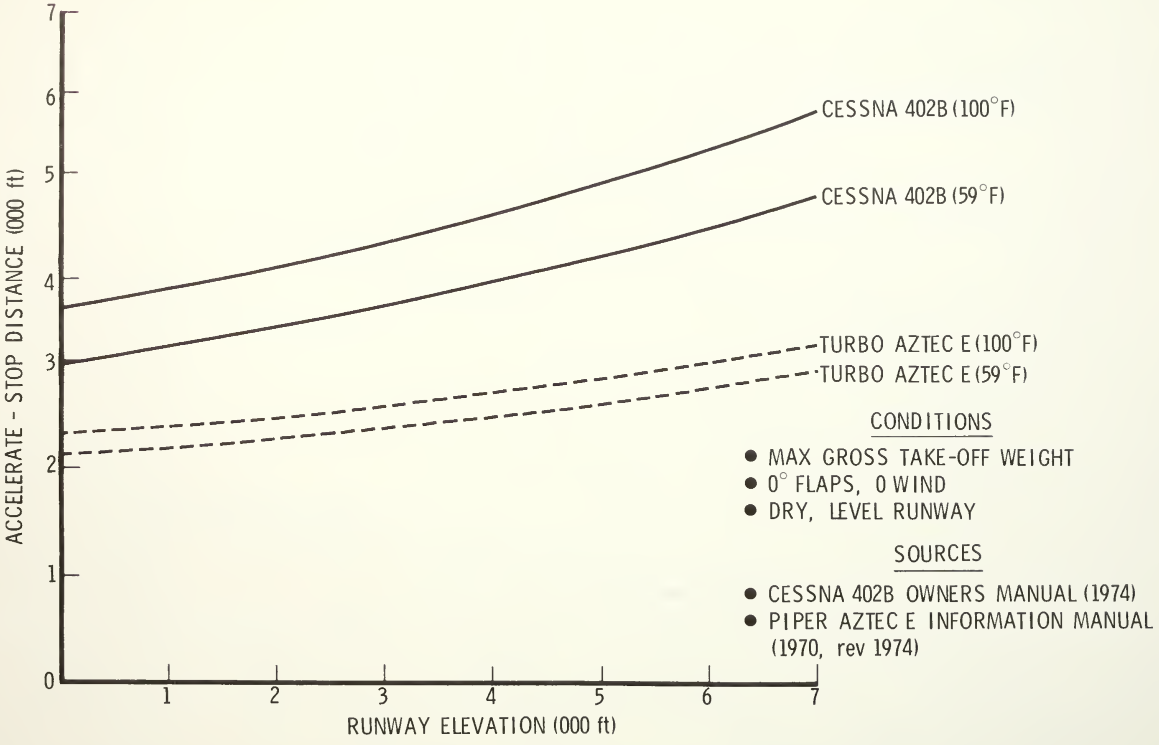
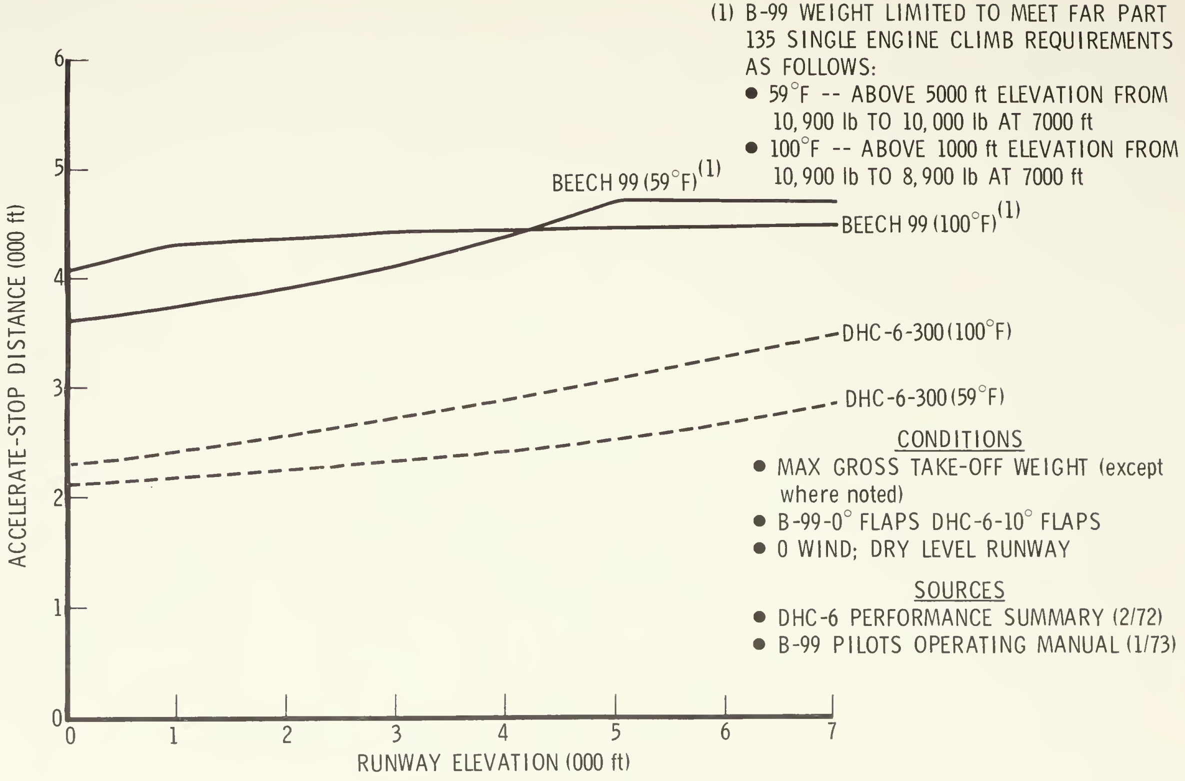


Figure 18. Commuter Aircraft Runway Requirements--Cessna 402B and Turbo Aztec E



(1) B-99 WEIGHT LIMITED TO MEET FAR PART 135 SINGLE ENGINE CLIMB REQUIREMENTS AS FOLLOWS:

- 59°F -- ABOVE 5000 ft ELEVATION FROM 10,900 lb TO 10,000 lb AT 7000 ft
- 100°F -- ABOVE 1000 ft ELEVATION FROM 10,900 lb TO 8,900 lb AT 7000 ft

CONDITIONS

- MAX GROSS TAKE-OFF WEIGHT (except where noted)
- B-99-0° FLAPS DHC-6-10° FLAPS
- 0 WIND; DRY LEVEL RUNWAY

SOURCES

- DHC-6 PERFORMANCE SUMMARY (2/72)
- B-99 PILOTS OPERATING MANUAL (1/73)

Figure 19. Commuter Aircraft Runway Requirements--Beech 99 and DHC-6-300

## TABLE XL. AIRPORT NEEDS FOR COMMUTER AIR SERVICE

| State/ Community | Airport | Required Improvements | | | | | |
|---|---|---|---|---|---|---|---|
| | | Largest Recommended Aircraft Size (Pass.) | Instrument Approach Aids | Runway Lights | Rotating Beacon | Terminal Facilities | Runway Length/Aircraft Requirements (Full Fuel Load, 100° OAT[a]) |
| Montana | | | | | | | |
| Dillon | | 8 | | MIRL's req'd | | Mobile facilities req'd | 8 pass. A/C limited to 50% load factor |
| Forsythe | | 5 | | | | Mobile facilities req'd | 5 pass. A/C limited to 60% load factor |
| Nebraska | | | | | | | |
| Broken Bow | (Municipal) | 8 | | | | | A/C limited to 50% load factor |
| Fairbury | (Municipal) | 5 | NDB req'd | MIRL's req'd | | | |
| Ogallala | Searle Field | 5 | | MIRL's req'd | | | |
| O'Neill | (Municipal) | 8 | | | | | A/C limited to 50% load factor |
| North Dakota | | | | | | | |
| Bowman | (Municipal) | 5 | NDB req'd | | | | |
| Lisbon | (Municipal) | 5 | NDB req'd | MIRL's req'd | | Mobile facilities req'd | |
| Rugby | (Municipal) | 5 | Published approach procedure req'd | MIRL's req'd | | Mobile facilities req'd | |
| Stanley | (Municipal | 5 | NDB req'd | MIRL's req'd | | Mobile facilities req'd | |
| Valley City | (Municipal) | 5 | NDB req'd | MIRL's req'd | | Mobile facilities req'd | |
| Wahpeton | Breckinridge Wahpeton Intrs. | 5 | NDB req'd | | | | |
| South Dakota | | | | | | | |
| Mobridge | (Municipal) | 5 | Published approach procedure req'd | | | | |
| Philip | (Municipal) | 5 | | MIRL's req'd | | Mobile facilities req'd | |
| Pine Ridge | Tribe | 5 | NDB req'd | | | Mobile facilities req'd | |
| Wyoming | | | | | | | |
| Douglas | Converse County | 5 | Published approach procedure req'd | | | Mobile facilities req'd | |
| Evanston | (Municipal) | 8 | NDB req'd | | | Mobile facilities req'd | 8 pass. A/C limited to 75% load factor |
| Kemmerer | (Municipal) | 8 | NDB req'd | MIRL's req'd | Beacon req'd | Mobile facilities req'd | |
| Newcastle | Mondell Field | 5 | | | | Mobile facilities req'd | |
| Saratoga | Shively Field | 8 | NDB req'd | MIRL's req'd | | | |
| Torrington | (Municipal) | 5 | NDB req'd | | | Mobile facilities req'd | |
| Wheatland | Phifer Airfield | 5 | NDB req'd | | | Mobile facilities req'd | |

[a] Outside Air Temperature

airports. Although off-loading of aircraft may be required under full-load and very hot temperature conditions at selected airports, none were considered deficient to the point of requiring recommendations to lengthen runways.

The costs of airport improvements related to the recommended commuter air service system are discussed in the "Recommended Commuter System" section.

- GENERAL
- LOCAL SERVICE AIRLINE SUBSIDY
- COMMUTER REPLACEMENT NETWORK
- SUMMARY RESULTS

# LOCAL SERVICE SUBSIDY ANALYSIS

- General

A special analysis was made of federally subsidized service by the local service carriers in the Old West Region. The routes that were examined included those of Frontier, North Central, and Hughes Airwest. The purpose of the analysis was to determine the amount of the subsidy paid in the region and compare it with the costs of a commuter replacement network supplying equal or superior service. Specific analysis objectives included the following:

- Determination of the subsidy need required by each carrier for subsidy-eligible routes
- Calculation of the actual subsidy allocated and received by each carrier on a route segment basis
- Development of a replacement commuter network, and determination of its subsidy need (if any) and attendant demand and service characteristics

- Local Service Airline Subsidy

(1) Subsidy Needed

The subsidized routes that were considered in the analysis are shown in Figure 20. It should be noted that these do not include nonsubsidized routes of the local service carriers or routes exclusively served by trunk airlines (which are not subsidized). Direct service to selected large cities outside the region, such as Denver and Salt Lake City, were included and their related subsidies charged to the region.

The subsidy need on a route segment basis is shown in Tables XLI through XLIII. These data were derived from submittals by the carriers to the CAB (Refs. 15, 16, and 17) for the latest time period available (FY 1974). The local service carriers computed these needs, using costing and revenue allocation formulas set down by the CAB on the basis of actual on-board traffic. The computed subsidy need includes a return on investment element for the recognized investment base.

(2) Subsidy Received

The computed subsidy need is not what the carrier actually receives. The actual subsidy is determined by a subsidy formula that is based on a composite of local service carriers' experience and uses hypothetical, not actual, on-board passenger traffic (Ref. 18). The hypothetical segment passengers used for subsidy determination purposes are established for each segment as a function of the combination of points served and are listed in Table XLIV. Each point served is classed A, B, C, D, or E in descending order depending on number of annual enplanements (Ref. 19). The hub classification for each city receiving subsidized service is shown in Table XLV.

The annual subsidy for FY 1974 was calculated per the CAB Class Rate VII formula, which involved the following:

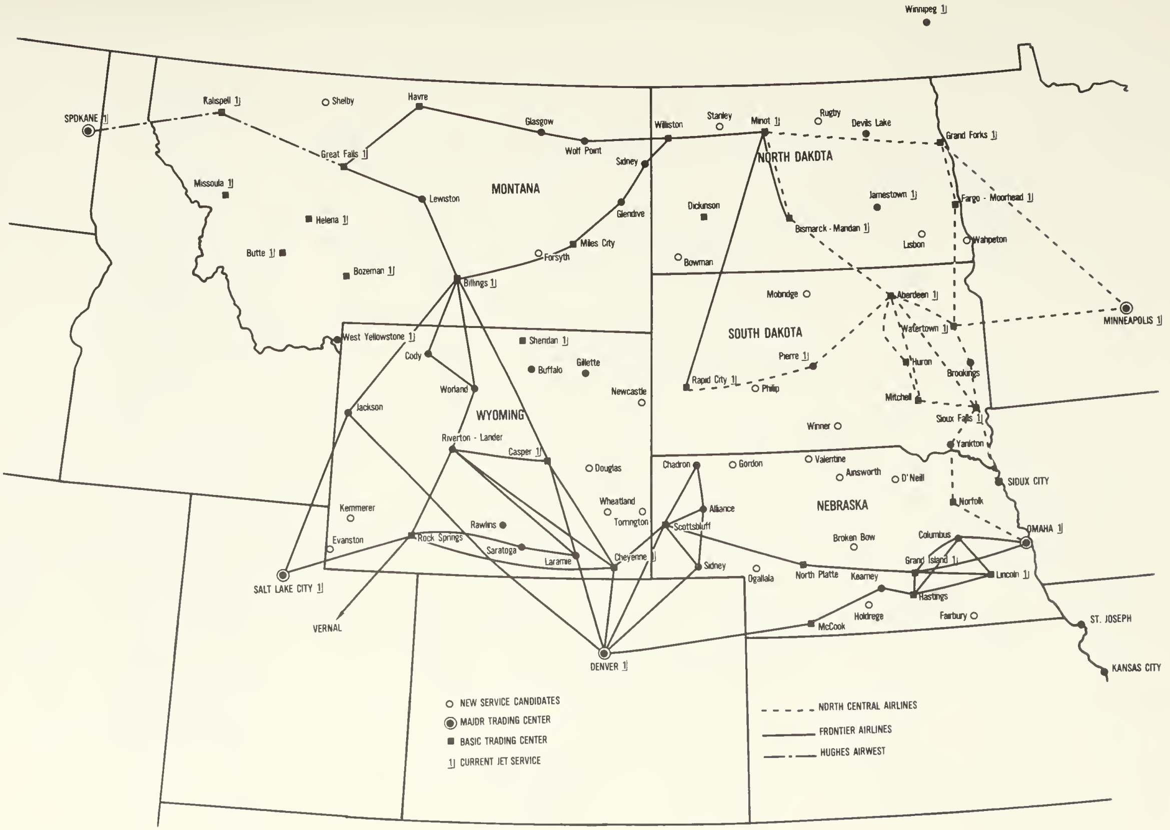


Figure 20. Local Service Airline Subsidized Routes (FY 1974)

## TABLE XLI. FRONTIER SEGMENT SUBSIDY DATA (FY 1974)

| City-Pair | Subsidy Need ($ 000) | Subsidy Paid[a] ($ 000) |
|---|---|---|
| Alliance-Chadron | 129 | 76 |
| Alliance-Scottsbluff | 61 | 26 |
| Alliance-Sidney | 42 | b |
| Billings-Casper | -76 | 108 |
| Billings-Cody | 188 | 54 |
| Billings-Jackson | 180 | 176 |
| Billings-Lewiston | 94 | 57 |
| Billings-Miles City | 75 | 80 |
| Billings-Worland | 24 | b |
| Bismarck-Minot | 386 | 89 |
| Casper-Cheyenne | 11 | 145 |
| Casper-Laramie | 5 | 148 |
| Casper-Riverton | 179 | 127 |
| Chadron-Scottsbluff | 12 | b |
| Cheyenne-Denver | 106 | 62 |
| Cheyenne-Riverton | 1 | b |
| Cheyenne-Rock Springs | 13 | b |
| Cheyenne-Scottsbluff | 9 | b |
| Cody-Worland | 191 | 88 |
| Columbus-Grand Island | 91 | 75 |
| Columbus-Hastings | 21 | b |
| Columbus-Lincoln | 70 | b |
| Columbus-Omaha | 93 | 80 |
| Denver-Jackson | -276 | 360 |
| Denver-Laramie | 151 | 59 |
| Denver-McCook | 119 | 125 |
| Denver-Scottsbluff | -84 | 125 |
| Denver-Sidney | 105 | 142 |
| Glasgow-Havre | 92 | 98 |
| Glasgow-Wolf Point | 56 | 33 |
| Glendive-Miles City | 54 | 50 |
| Glendive-Sidney | 51 | 32 |
| Grand Island-Hastings | 97 | 16 |
| Grand Island-Lincoln | 167 | 63 |
| Grand Island-Omaha | 20 | 52 |
| Grand Island-North Platte | 101 | 119 |
| Great Falls-Havre | 78 | 61 |
| Great Falls-Lewiston | 98 | 55 |
| Hastings-Kearney | 126 | 21 |
| Hastings-Lincoln | 6 | b |
| Jackson-Salt Lake City | -149 | 182 |
| Kearney-McCook | 106 | 61 |
| Laramie-Riverton | -1 | 125 |
| Laramie-Rock Springs | 61 | 112 |
| Minot-Rapid City | 17 | 149 |
| Minot-Williston | 64 | 69 |
| North Platte-Scottsbluff | 42 | 157 |
| Riverton-Rock Springs | 48 | 67 |
| Riverton-Worland | 245 | 91 |
| Rock Springs-Salt Lake City | 17 | b |
| Rock Springs-Vernal | 28 | 104 |
| Scottsbluff-Sidney | 50 | 77 |
| Sidney-Williston | 61 | 28 |
| Williston-Wolf Point | 67 | 60 |
| Total | 3,522 | 4,084 |

[a] Not including subsidy eligible station allocations (estimated at $2, 100, 000 for Frontier eligible stations in region @ $60, 000/station). Also not including a -10. 31% need adjustment factor.

[b] Negligible.

TABLE XLII. NORTH CENTRAL SEGMENT SUBSIDY DATA (FY 1974)

| City-Pair | Subsidy Need ($000) | Subsidy Paid[a] ($000) |
|---|---|---|
| Aberdeen — Huron | 34 | 46 |
| Aberdeen — Mitchell | 10 | 16 |
| Aberdeen — Sioux Falls | 10 | 140 |
| Aberdeen — Watertown | 27 | 91 |
| Bismarck — Aberdeen | 207 | 140 |
| Brookings — Sioux Falls | 148 | 55 |
| Fargo — Watertown | 197 | 167 |
| Grand Forks — Fargo | 283 | 54 |
| Grand Forks — Minneapolis | -862 | 245 |
| Huron — Mitchell | 132 | 117 |
| Minot — Bismarck | 258 | 98 |
| Minot — Grand Forks | 100 | 192 |
| Mitchell — Sioux Falls | 158 | 151 |
| Norfolk — Omaha | 163 | 100 |
| Pierre — Aberdeen | 85 | 112 |
| Rapid City — Pierre | 199 | 126 |
| Sioux Falls — Yankton | 198 | 63 |
| Watertown — Brookings | 140 | 61 |
| Watertown — Minneapolis | -315 | 207 |
| Yankton — Norfolk | 174 | 87 |
| TOTAL | 1, 346 | 2, 270 |

[a] Not including subsidy eligible station allocations (est. at $900, 000 for 15 North Central eligible stations in region @ $60, 000 /station). Also not including +4. 39% system need adjustment factor.

## TABLE XLIII. HUGHES AIRWEST SEGMENT SUBSIDY DATA

## (FY 1974)

| | Subsidy Need ($ 000) | Subsidy Paid[a] ($ 000) |
|---|---|---|
| Kalispell-Great Falls | 261 | 174 |
| Kalispell-Spokane | 16 | 192 |
| TOTAL | 277 | 366 |

[a] Not including subsidy eligible station allocations (two within region @ $60,000/station = $120,000). Also not including +25.9% system need adjustment factor.

## TABLE XLIV. LOCAL SERVICE CLASS SUBSIDY RATE

### Required Passengers Per Revenue Plane-Mile For Subsidy-Eligible Operations

| Classified Pairs of Points | Required Passengers Per Revenue Plane-Mile |
|---|---|
| C - C | 20.9 |
| A - D | 20.4 |
| B - D | 19.9 |
| C - D | 19.4 |
| D - D | 18.9 |
| A - E | 18.4 |
| B - E | 17.9 |
| C - E | 17.4 |
| D - E | 16.9 |
| E - E | 16.4 |

## TABLE XLV. CLASSIFICATION OF OLD WEST REGION RELATED SUBSIDY-ELIGIBLE STATIONS

| City | Hub Classification |
|---|---|
| Aberdeen, So. Dakota | D |
| Alliance, Nebraska | E |
| Billings, Montana | C |
| Bismarck, No. Dakota | C |
| Bozeman, Montana | D |
| Brookings, So. Dakota | E |
| Casper, Wyoming | D |
| Cheyenne, Wyoming | D |
| Chadron, Nebraska | E |
| Columbus, Nebraska | E |
| Denver, Colorado | A |
| Devils Lake, No. Dakota | E |
| Fargo, No. Dakota | C |
| Ft. Dodge, Iowa | E |
| Glendive, Montana | E |
| Grand Forks, No. Dakota | D |
| Glasgow, Montana | E |
| Grand Island, Nebraska | D |
| Great Falls, Montana | C |
| Huron, So. Dakota | E |
| Hastings, Nebraska | E |
| Havre, Montana | E |
| Jackson, Wyoming | D |
| Kalispell, Montana | E |
| Kearney, Nebraska | E |
| Laramie, Wyoming | E |
| Lincoln, Nebraska | C |
| Lewiston, Montana | E |
| Lovell, Wyoming | E |
| McCook, Nebraska | E |
| Mason City, Iowa | E |
| Mitchell, So. Dakota | E |
| Miles City, Montana | E |
| Minot, No. Dakota | D |
| Missoula, Montana | D |
| Minneapolis, Minnesota | A |
| North Platte, Nebraska | D |
| Norfolk, Nebraska | E |
| Omaha, Nebraska | B |
| Pierre, So. Dakota | E |
| Rapid City, So. Dakota | C |
| Riverton, Wyoming | E |
| Rock Springs, Wyoming | D |
| Rochester, Minnesota | C |
| St. Joseph, Missouri (Kansas City Int'l) | A |
| Scottsbluff, Nebraska | D |
| Salt Lake City, Utah | B |
| Sidney, Montana | E |
| Sidney, Nebraska | E |
| Sioux City, Iowa | D |
| Sioux Falls, So. Dakota | C |
| Spokane, Washington | B |
| Thief River Falls, Minn. | E |
| Vernal, Utah | E |
| Watertown, So. Dakota | E |
| Williston, No. Dakota | E |
| Wolf Point, Montana | E |
| Worland, Wyoming | E |
| Worthington, Minnesota | E |
| West Yellowstone, Montana | E |
| Yankton, So. Dakota | E |

- The sum of the following factors:
  - $60,000 per station
  - $95.00 per departure
  - $1.89 per plane mile

- Less the sum of the following:
  - $5.70 per revenue passenger
  - $.06 per revenue passenger-mile

Subsidy-eligible services are limited to a maximum of two daily trips between pairs of points with the following classifications: A - D, B - D, A - E, B - E, C - C, C - D, C - E, D - D, D - E, and E - E. Thus, essentially all service except hub to hub service (A - A, A - B, B - C, B - B, and A - C) is subsidy eligible. In addition the total system-wide subsidy is modified by a need adjustment factor, which is used to reflect the relative needs of the local service carriers. The percentages assigned to the carriers for FY 1974 were + 25.90 percent for Hughes Airwest, + 4.39 percent for North Central, and -10.31 percent for Frontier (a downward adjustment). Tables XLI through XLIII also list the allocated subsidy for each carrier, both with and without the need adjustment, and compare the need subsidy with the amount actually received. Although the factor of $60,000 per station appears in the CAB formula, it was omitted from the segment allocation of Tables XLI through XLIII, and is instead compared separately and added to the summary totals in Table XLVII.

- Commuter Replacement Network

The next step in the analysis was to determine the characteristics of a commuter replacement service that would provide a minimum of two round trips per day to each of the city-pairs that received subsidized service. Figure 21 identifies the resulting replacement service rates that were developed using techniques identical to those used in the other networks discussed in this report. Special assumptions were made, however, as follows:

- o Those subsidized routes that were profitable (negative subsidy need) would continue to be served by the local service carrier, but on a nonsubsidy basis.

- o Those subsidized segments that were served jointly by a local service and a trunk carrier would be served entirely by that trunk carrier (also on a nonsubsidized basis).

There were eleven city-pairs that fall into the above two categories. They are listed in Table XLVI along with pertinent data on distances, 1973 demands, and service frequencies.

The demand that would be generated by a replacement commuter carrier was developed from CAB 1973 O&D data. This demand included on-line as well as inter-line connecting traffic. Growth factors were used to modify 1973 CAB data to reflect expected 1976 demand. The 1976 nominal demand was also adjusted to reflect service improvements such as frequency and number of intermediate stops, and thus account for expected induced demand. The actual 1973 demands and fares and the nominal 1976 demands and fares are listed in Appendix 4. The latter were used as basic inputs to the routing analysis computer program to develop specific commuter replacement routes, service frequencies, and economic characteristics (e.g., revenus, cost, and profit/loss). The final replacement network and data are also shown in Appendix 4.

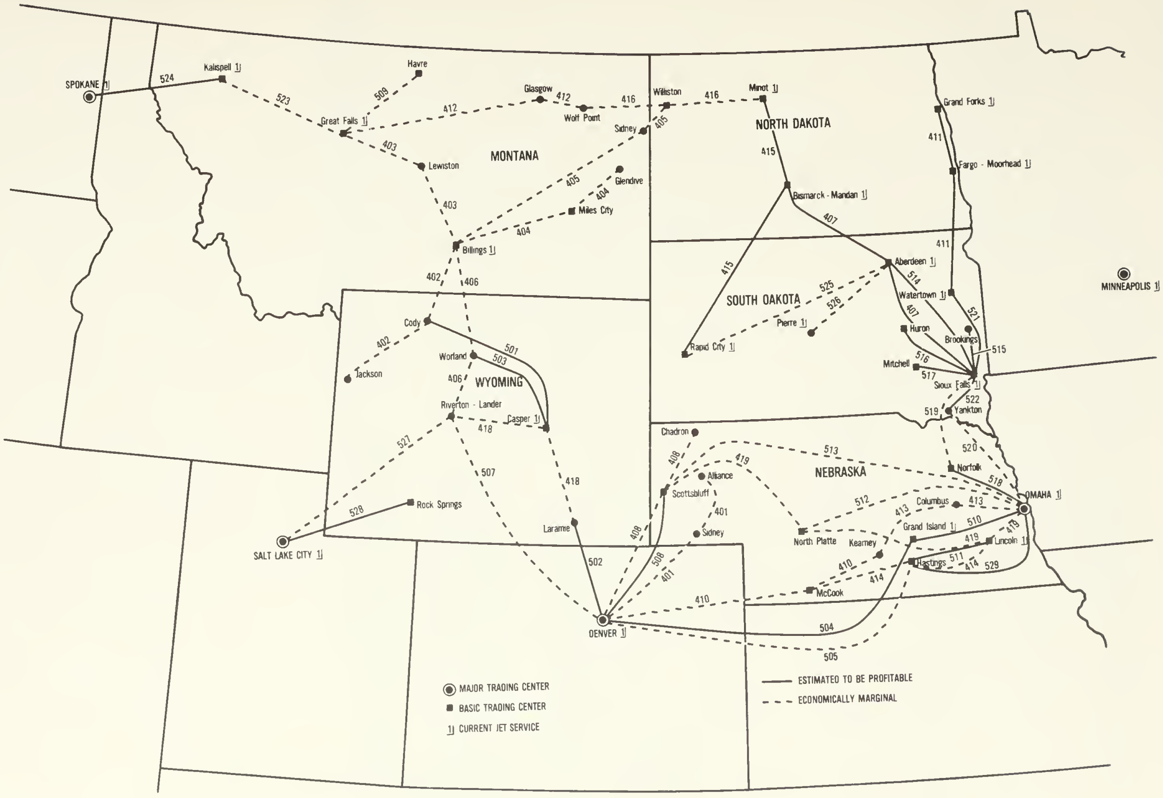


Figure 21. Commuter Replacement Network for Subsidized Local Service Airline Routes

TABLE XLVI. SUBSIDIZED SEGMENTS NOT REPLACED BY THE COMMUTER NETWORK

| City-Pair | Carrier | Dist. (smi) | 1973 Demand (Pass./Day) | Daily Frequency (Round Trips) |
|---|---|---|---|---|
| Aberdeen — Watertown — Minneapolis | North Central | 257 | 58.5 | 2 |
| Billings — Casper | Western Airlines | 225 | 7.0 | 3 |
| Casper — Cheyenne | Western Airlines | 148 | 0.8 | 2 |
| Cheyenne — Denver | Frontier | 96 | 107.0 | 8 |
| Denver — Jackson | Frontier | 402 | 52.4 | 1 |
| Grand Forks — Minneapolis | Northwest | 284 | 133.0 | 6 |
| Grand Forks — Minot | North Central | 191 | 10.2 | 2 |
| Jackson — Salt Lake City | Frontier | 205 | 46.9 | 1.5 |
| Minneapolis — Minot | North Central | 449 | 121.2 | 2 |
| Minneapolis — Watertown | North Central | 193 | 37.1 | 2 |
| Pierre — Rapid City | Western Airlines | 140 | 9.2 | 4 |

- Summary Results

A summary of the subsidy analysis and replacement service is shown in Table XLVII. Note that in the Old West Region subsidy summary, the subsidy data derived from the CAB is for FY 1974 but the demands (annual passengers) were for CY 1973. The latter was chosen to be consistent with other analyses discussed in this report. Since the FY 1974 data included the three-month period of increased demand because of the energy crisis, this analysis tends to overestimate the subsidy per passenger (although probably by no more than five percent).

As seen in the subsidy summary totals, the local service carriers in FY 1974 provided a total of 227 departures per day at a cost to the federal government of $9.5 million, or $16.96 for every passenger served. In 1976, it is estimated that the commuter replacement network, operating in conjunction with local service and trunk carrier nonsubsidized service, could provide the region with a total of 351 departures per day at a total subsidy cost for the commuter system of only $0.6 million. As seen in the last column of Table XLVII, this amount is a net increase of 55 percent in service, a reduction of 94 percent in subsidy requirements, and an increase in demand of 22 percent. The net subsidy per passenger would be under $1.00 compared to the $16.96 paid in FY 1974. This significant reduction in subsidy requirements is primarily the result of assigning commuter aircraft of a size tailored to fit the needs of the region.

# TABLE XLVII. OLD WEST REGION SUBSIDY SUMMARY AND TOTAL REPLACEMENT SERVICE

| Old West Subsidy Summary--FY 1974 | | | | | Total Replacement Service--1976 | | | |
|---|---|---|---|---|---|---|---|---|
| Local Service Carrier | Frontier | North Central | Hughes Airwest | Totals | Commuter Replacement Network | Retained Local Service Segments[a] | Totals | Net Change |
| Departures/Day | 152 | 67 | 8 | 227 | 302 | 49 | 351 | +124 (+55%) |
| Subsidy Need (000) | $ 3,522 | $ 1,346 | $277 | $ 5,145 | $ 588 | — | $ 588 | -$ 4,557 (-89%) |
| Subsidy Received (000) | $ 5,546 | $ 3,309 | $612 | $ 9,467 | — | — | $ 588 | -$ 8,879 (-94%) |
| Segment Formula | $ 4,084 | $ 2,270 | $366 | $ 6,720 | | | | |
| Station Formula[b] | $ 2,100 | $ 900 | $120 | $ 3,120 | | | | |
| Need Adjustment | -$ 638<br>(-10.31%) | $ 139<br>(4.39%) | $126<br>(25.90%) | -$ 373 | | | | |
| Annual Passengers (000) | 307.7[c] | 225.5[c] | 25.0[c] | 588.2[c] | 450.1 | 230.5 | 680.6 | +122.4 (+22%) |
| Annual Revenue (000) | $ 8,997 | $ 6,734 | $576 | $16,307 | $13,018 | $8,768 | $21,786 | $ 5,479 (+34%) |
| Subsidy (Loss) Ratio | 0.62 | 0.49 | 1.06 | 0.58 | 0.05 | — | 0.03 | -0.55 (-95%) |
| Subsidy Per Passenger | $18.02 | $14.67 | $24.48 | $16.96 | $ 1.31 | — | $ 0.86 | -$16.10 (-95%) |

[a] Segments showing a negative subsidy need in FY 1974. Such segments were assumed to continue to be served by local service carriers but on an unsubsidized basis.

[b] Excludes all stations outside the region.

[c] Calendar Year 1973 demand.

- RECOMMENDED SYSTEM SELECTION
- ANALYSIS OF RECOMMENDED SYSTEM
- ECONOMIC SUMMARY
- ROUTE COUPLING ANALYSIS
- AIRPORT NEEDS

## RECOMMENDED COMMUTER SYSTEM

- Recommended System Selection

As discussed in the previous sections, two alternative air service systems were investigated in detail. In order to arrive at a single system that would be most feasible for serving the needs of the Old West Region, various features of each of these alternatives were assessed. Initially, a maximum economic assistance (subsidy) threshold was established. It was considered that any route or route segment exhibiting an economic assistance ratio higher than one (i.e., the subsidy need per person would exceed the fare paid) would not warrant further consideration. As a result, the routes and route segments identified on Table XLVIII were deleted. Selected route segments of the Sub-regional Collector Concept were also adjusted to better serve communities in North Dakota, Wyoming, and Nebraska. These adjustments included the connection of Williston, North Dakota, with a route terminating in Billings, Montana; direct connection of Devils Lake, North Dakota, with Bismarck as well as Grand Forks; extending the Scottsbluff-Chardron-Pine Ridge route to include Rapid City also; extending the Broken Bow-Columbus-Omaha route to include North Platte (although still originating in Broken Bow); and direct routing of Ogallala and Sidney traffic to Denver. All current commuter airline routes in the region were also included (i.e., Gillette-Casper, Laramie-Saratoga-Rawlings-Casper, and a recently adopted route serving Rapid City, Gillette, Sheridan, and Billings). As analysis of all of these added or changed routes resulted in a projected subsidy ratio of less than one, they were retained as an integral part of the recommended air service system.

In view of these changes as well as the other features of each alternative, a recommended commuter air service system was devised as shown in Figure 22. Route segments in this figure that are not numbered are non-stop routes normally originating in the smaller community. One- and multi-stop routes

## TABLE XLVIII. ROUTES EXCEEDING MAXIMUM ECONOMIC ASSISTANCE THRESHOLD

MONTANA

- Forsyth-Billings

NEBRASKA

- Ogallala-North Platte

NORTH DAKOTA

- Rugby-Minot
- Bowman-Dickenson (Bismarck)
- Valley City-Fargo
- Lisbon-Fargo
- Wahpeton-Fargo

SOUTH DAKOTA

- Philip-Rapid City
- Mobridge-Aberdeen
- Newcastle (Wyo.)-Rapid City

WYOMING

- Cody-Billings (Mont.)
- Douglas-Casper

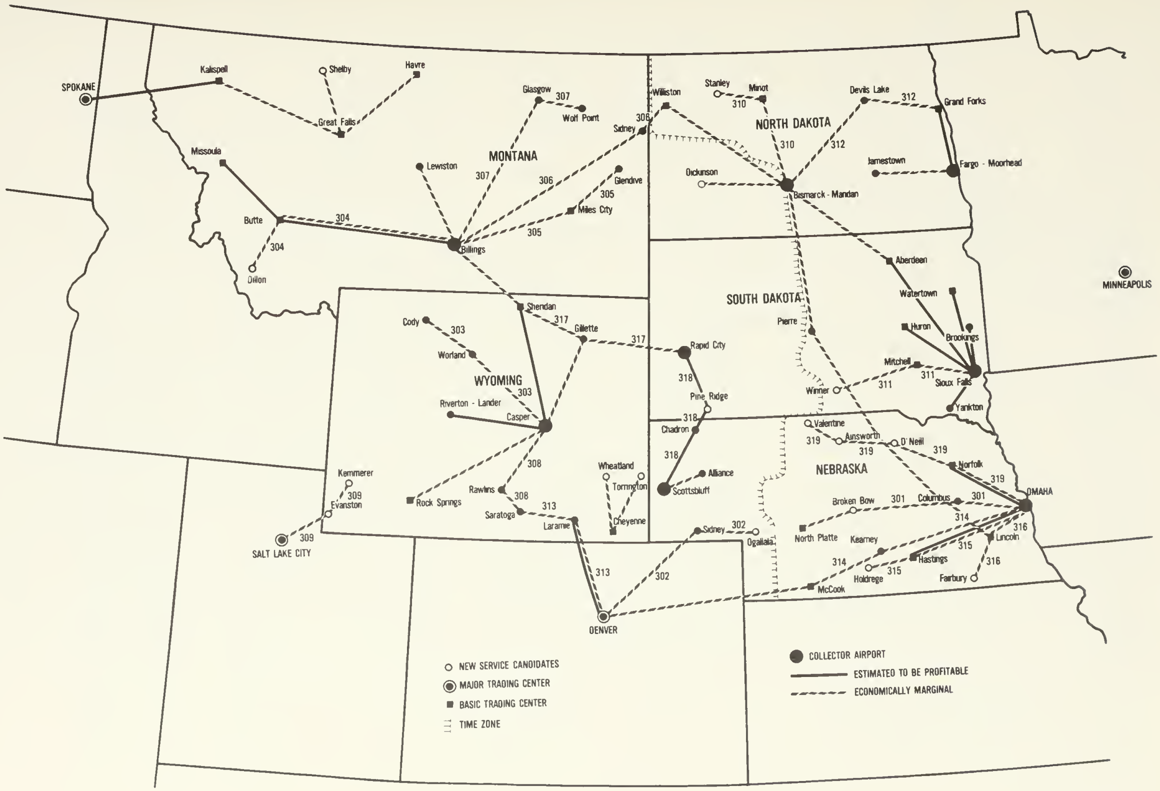


Figure 22. Recommended Commuter Air Service System

are numbered to facilitate identification of interconnecting segments. Figure 23 identifies the respective impacts on the current certificated air carrier service.

The recommended system is primarily based upon the Subregional Collector Concept alternative but includes selected routes and features from the Basic Network Concept. It attempts to optimize the service and economic benefits of the Subregional Collector Concept and the Basic Network Concept while minimizing the potential limitations of each. Specifically, the recommended system reflects the following comparative advantages of a subregional collector feeder concept:

- It provides more through-plane service to the principal hubs of travel interest than the Basic Network. It also better terminates commuter route segments at major collector points with superior connecting service.

- It better serves the region's travel desires through more realistic aircraft routing to the principal intra-regional hubs of interest.

- It provides an increased potential for improved inter- and intra-regional certificated service from the collector points by feeding added passengers from the outlying communities.

- It provides a system that facilitates more efficient route structures and better aircraft utilization when routes are coupled and matched with recommended aircraft.

- The profitability of the resulting system is less dependent upon the replacement of current profitable certificated air service routes than the Basic Network.

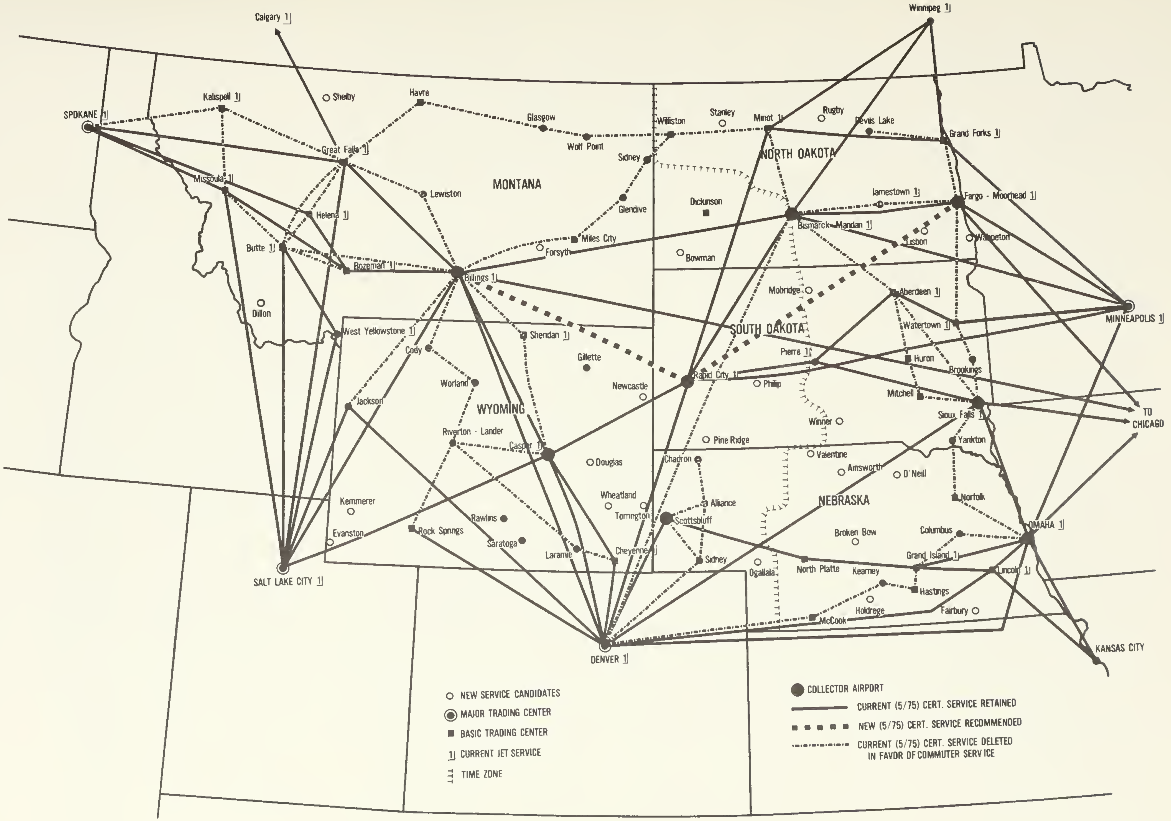


Figure 23. Recommended Commuter Air Service Concept--Certificated Air Service Impacts

The recommended system still retains however, certain features that could complicate implementation as a total system. It reflects the deletion of current certificated jet service from Butte, Sheridan, and Kalispell because of significantly lower historical service and patronage levels than exhibited on other certificated air service routes that were assumed to be retained.(1) The recommended system reflects replacement commuter service on the majority of the routes currently served by older 50-passenger turboprop aircraft. It assumes the addition of new certificated air service between Fargo and Rapid City, and Billings and Rapid City, and direct service from Fargo to Sioux Falls in order to better interconnect the collector hub cities. Although such service deletions and additions are considered feasible (Frontier, for example, has already received CAB approval to provide new air service between Fargo and Rapid City), such service is still dependent upon agreement and implementation by the certificated air carriers. In spite of these limitations, however, the system appears to be the most promising combination for implementation of a commuter air service network as success of the system does not basically depend on total implementation. Implementation as an integral system would, of course, permit maximum use of economy of scale and cross-subsidy benefits. However, should selected segments not be implemented in view of contrary certificated air carrier planning, the system integrity will not be totally compromised. Implementation of the remaining segments will still provide significant progress toward improving the region's air service.

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(1) Hughes Airwest has, however, recently stated their intention to increase service levels between Spokane, Kalispell, and Great Falls.

- Analysis of Recommended System

The recommended system was analyzed in detail using the same approach and techniques utilized in assessing the Basic Network and the Subregional Collector Concepts. Patronage estimates were made and appropriate aircraft, service features, and resultant system economics determined under a number of operating conditions.

Initially, the system was analyzed under 1976 mature demand conditions both with and without an average 12.35 percent annual ROI included for the operator. This analysis was accomplished to identify a range of profitability (or subsidy need) under conditions wherein an operator may be willing to accept less than a 12.35 percent average ROI in order to obtain service privileges.

The system characteristics and economics during the first-year demand build-up period were also assessed. A composite of commuter air service experience in the Western states indicates that a typical market will normally take approximately one year to mature with an average patronage level that first year of approximately 75 percent of the final mature demand. Although the patronage level and time to mature are highly variable and often somewhat dependent upon local factors, these composite experience levels were used to provide a consistent basis for region-wide analysis. It was assumed that, during this first-year demand build-up, no operator return on investment would be expected.

The 1985 projected demand and resultant increase or decrease in route profitability (or subsidy need) were also calculated for the recommended system using the methodology described in the "Determentation of Air Demand" section. Changes between 1976 and 1985 resulted principally from increases or decreases in population of the service points. The recommended system economics were also investigated on a route-by-route basis assuming that one additional (or alternatively, one less) passenger per day used the system.

This assumption provided visibility into the benefits of promotion to have one additional passenger per day or the disbenefits of having one less passenger per day use the system when compared to the estimated mature demand patronage levels.

With the subsidy comparison analysis methodology described in the previous section, the net savings in federal subsidy if the recommended system were implemented was also determined. This comparison investigated the net savings if only the subsidized certificated air service segments suggested for replacement in the recommended system were replaced.

The individual route data related to each of these analyses for each route are included in Appendix 3. The following section, however, summarized the results of each of these analyses by state and route projected profitability categories.

- Economic Summary

As shown on Figure 22, all of the proposed routes are not estimated to be profitable, especially during the first-year demand build-up period. Table XLIX summarizes, by state, the 1976 estimated patronage and economics of total system implementation by route. As can be seen from the table, a profit per person for those 15 routes estimated to be profitable is approximately $4.70 during the first-year demand build-up period and approximately $8 to $9 per person under mature demand conditions depending upon the return on investment level received by the operator. Alternatively, the loss per person for those routes estimated to be economically marginal is estimated to be approximately $14 per person the first year, but should be reduced to approximately $5 to $6 under mature demand conditions. Should implementation be effected on a relatively full-scale system basis, the cross-subsidy benefit of route awards wherein an operator is awarded a profitable route along with an economically marginal route is obvious. Also, with a concerted effort by the community and the states involved to promote and support the air service actively, ultimate carrier viability on all routes may eventually be achieved.

Tables L and LI summarize the route profitability changes expected for 1985 based principally upon projected population changes (1976 dollars) and no additional promotion by the states and communities in the region. Although the economics of most routes are projected to be improved, some service areas are projected to decrease in population. In such instances additional economic assistance will be required when compared to 1976 estimates. The profitability or economic assistance needs are quite sensitive to having one more or one less passenger per day use the system. Table LII identifies the value, by route, of one daily passenger in relation to yearly profit. Typically, proper promotion to encourage an additional daily passenger will result in an added profit of as much as $12,000 per year, depending upon the individual route characteristics, fare levels, and service costs.

# TABLE XLIX. RECOMMENDED SYSTEM--ECONOMIC SUMMARY (1976)

| Route Category | No. Routes | Persons Served Per Day | | Annual Net Profit (Loss) ($000) | | | Profit (Cost Per Person ($) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | First Year | Mature | First Year[a] | Mature | | First Year[a] | Mature | |
| | | | | | Breakeven | With ROI[b] | | Breakeven | With ROI[b] |
| Profitable[c] | | | | | | | | | |
| Montana | 2 | 84 | 143 | 194.8 | 551.7 | 515.3 | 6.35 | 10.57 | 9.87 |
| Nebraska | 2 | 33 | 59 | 39.0 | 146.3 | 136.2 | 3.24 | 6.79 | 6.33 |
| North Dakota | 1 | 13 | 17 | 9.5 | 39.9 | 37.5 | 2.00 | 6.43 | 6.04 |
| South Dakota | 5 | 61 | 87 | 46.4 | 181.7 | 156.7 | 2.08 | 5.72 | 4.94 |
| Wyoming | 2 | 120 | 156 | 151.8 | 359.4 | 316.6 | 3.47 | 6.31 | 5.56 |
| Interstate | 3 | 69 | 77 | 269.8 | 527.5 | 482.7 | 10.71 | 18.77 | 17.17 |
| Total | 15 | 380 | 539 | 711.3 | 1806.5 | 1645.0 | 5.12<br>Average (Weighted) | 9.18 | 8.36 |
| Economically Marginal[c] | | | | | | | | | |
| Montana | 7 | 82 | 109 | (572.0) | (375.6) | (415.4) | (19.11) | (9.44) | (10.44) |
| Nebraska | 7 | 90 | 162 | (471.1) | (233.1) | (269.4) | (14.34) | (3.94) | (4.56) |
| North Dakota | 5 | 83 | 111 | (342.9) | (168.0) | (201.0) | (11.32) | (4.15) | (4.96) |
| South Dakota | 1 | 44 | 58 | (76.1) | (8.8) | (13.6) | (4.74) | (0.42) | (0.64) |
| Wyoming | 6 | 71 | 95 | (425.9) | (275.9) | (308.3) | (16.43) | (7.96) | (8.89) |
| Interstate | 10 | 173 | 237 | (879.9) | (476.2) | (535.4) | (13.9) | (5.5) | (6.19) |
| Total | 36 | 543 | 772 | (2767.9) | (1537.6) | (1743.1) | (13.96)<br>Average (Weighted) | (5.46) | (6.19) |

[a] Does not include one-time operator start-up costs estimated at $6,000 plus $1,700 per station for an existing operator or $9,000 plus $1,700 per station for a new operator (see "Commuter Aircraft and Airline Economies" section).

[b] Includes 12.35% average annual return on investment.

[c] Under mature demand conditions.

## TABLE L. 1985 PROFITABILITY--NON-STOP ROUTES

| Route (City-Pair) | 1976 Profit (Loss) ($000) | 1985 Profit (Loss) ($000) | Change ($000) |
|---|---|---|---|
| Aberdeen — Bismarck | (15.3) | (25.0) | (9.7) |
| Aberdeen — Sioux Falls | 83.9 | 96.2 | 12.3 |
| Alliance — Scottsbluff | (13.7) | (12.3) | 1.4 |
| Billings — Butte | 248.8 | 363.1 | 114.3 |
| Billings — Lewiston | (57.0) | (50.1) | 6.9 |
| Billings — Sheridan | (33.5) | (17.7) | 15.8 |
| Bismarck — Dickinson | (42.6) | (49.5) | (6.9) |
| Bismarck — Pierre | (98.4) | (98.4) | 0 |
| Bismarck — Williston | (47.0) | (65.1) | (18.1) |
| Broken Bow — N. Platte | (27.0) | (27.0) | 0 |
| Brookings — Sioux Falls | 2.6 | 8.4 | 5.8 |
| Butte — Missoula | 266.5 | 375.9 | 109.4 |
| Casper — Gillette | (11.7) | (2.9) | 8.8 |
| Casper — Riverton | 125.0 | 172.2 | 47.2 |
| Casper — Rock Springs | (77.8) | (59.7) | 18.1 |
| Casper — Sheridan | 191.6 | 290.6 | 99.0 |
| Cheyenne — Torrington | (50.7) | (45.7) | 5.0 |
| Cheyenne — Wheatland | (48.8) | (43.3) | 5.5 |
| Denver — Laramie | 28.2 | 18.3 | (9.9) |
| Denver — McCook | (46.3) | (20.7) | 25.6 |
| Fargo — Grand Forks | 37.5 | 62.5 | 25.0 |
| Fargo — Jamestown | (22.0) | (14.2) | 7.8 |
| Great Falls — Havre | (68.2) | (62.3) | 5.9 |
| Great Falls — Kalispell | (92.6) | (64.6) | 28.0 |
| Great Falls — Shelby | (48.7) | (48.7) | 0 |
| Hastings — Omaha | 53.2 | 63.8 | 10.6 |
| Huron — Sioux Falls | 45.6 | 47.5 | 1.9 |
| Kalispell — Spokane | 452.8 | 438.2 | (14.6) |
| Lincoln — Pierre | (100.6) | (67.2) | 33.4 |
| Norfolk — Omaha | 83.0 | 125.4 | 42.4 |
| Sioux Falls — Watertown | 4.8 | 8.2 | 3.4 |
| Sioux Falls — Yankton | 19.8 | 23.8 | 4.0 |
| Non-Stop Route Total | 742.1 | 1319.7 | 577.6 |

## TABLE LI. 1985 PROFITABILITY--ONE-STOP AND MULTI-STOP ROUTES

| Route | 1976 Profit (Loss) ($000) | 1985 Profit (Loss) ($000) | Change ($000) |
|---|---|---|---|
| Broken Bow — Columbus — Omaha | (37.6) | (36.4) | 1.2 |
| Denver — Sidney — Ogallala | (64.7) | (44.2) | 20.5 |
| Casper — Worland — Cody | (85.0) | (71.5) | 13.5 |
| Billings — Butte — Dillon | (11.7) | (9.5) | 2.2 |
| Billings — Miles City — Glendive | (83.4) | (75.9) | 7.5 |
| Billings — Sidney — Williston | (96.1) | (89.5) | 6.6 |
| Billings — Glasgow — Wolf Point | (53.8) | (43.9) | 9.9 |
| Casper — Rawlins — Saratoga | (34.3) | (31.5) | 2.8 |
| Kemmerer — Evanston — Salt Lake City | (16.3) | (10.6) | 5.7 |
| Bismarck — Minot — Stanley | (21.5) | (21.5) | 0 |
| Sioux Falls — Mitchell — Winner | (13.6) | (10.0) | 3.6 |
| Bismarck — Devils Lake — Grand Forks | (67.9) | (71.8) | (3.9) |
| Denver — Laramie — Saratoga | (31.0) | (29.0) | 2.0 |
| McCook — Kearney — Omaha | (45.3) | (43.1) | 2.2 |
| Holdress — Hastings — Omaha | (8.7) | 1.6 | 10.3 |
| Fairbury — Lincoln — Omaha | (26.8) | (26.8) | 0 |
| Rapid City — Gillette — Sheridan | (33.2) | (13.5) | 19.7 |
| Rapid City — Pine Ridge — Chadron — Scottsbluff | 1.7 | 6.7 | 5.0 |
| Omaha — Norfolk — O'Neill — Ainsworth — Valentine | (108.9) | (105.3) | 3.6 |
| One-Stop and Multi-Stop Route Total | (838.1) | (725.7) | 112.4 |

TABLE LII. VALUE OF ONE ADDITIONAL DAILY PASSENGER--RECOMMENDED SYSTEM

| Route | Annual Profit from One Additional Daily Passenger ($) | Route | Annual Profit from One Additional Daily Passenger ($) |
|---|---|---|---|
| Aberdeen-Bismarck | 6,700 | Lincoln-Pierre | 12,100 |
| Aberdeen-Sioux Falls | 9,000 | Norfolk-Omaha | 7,100 |
| Alliance-Scottsbluff | 3,500 | Sioux Falls-Watertown | 5,100 |
| Billings-Butte | 10,800 | Sioux Falls-Yankton | 4,800 |
| Billings-Lewiston | 4,700 | Broken Bow-Columbus-Omaha | 10,600 |
| Billings-Sheridan | 5,700 | Denver-Sidney-Ogallala | 8,600 |
| Bismarck-Dickinson | 4,700 | Casper-Worland-Cody | 9,600 |
| Bismarck-Pierre | 8,800 | Billings-Butte-Dillon | 9,600 |
| Bismarck-Williston | 6,600 | Billings-Miles City-Glendive | 8,900 |
| Broken Bow-N. Platte | 4,100 | Billings-Sidney-Williston | 10,800 |
| Brookings-Sioux Falls | 4,100 | Billings-Glasgow-Wolf Point | 10,900 |
| Butte-Missoula | 8,100 | Casper-Rawlins-Saratoga | 6,900 |
| Casper-Gillette | 4,700 | Kemmerer-Evanston-Salt Lake City | 7,400 |
| Casper-Riverton | 7,800 | | |
| Casper-Rock Springs | 6,000 | Bismarck-Minot-Stanley | 8,000 |
| Casper-Sheridan | 8,000 | Sioux Falls-Mitchell-Winner | 8,400 |
| Cheyenne-Torrington | 4,100 | Bismarck-Devils Lake-Grand Forks | 8,600 |
| Cheyenne-Wheatland | 3,800 | | |
| Denver-Laramie | 8,400 | Denver-Laramie-Saratoga | 8,700 |
| Denver-McCook | 8,900 | McCook-Kearney-Omaha | 10,600 |
| Fargo-Grand Forks | 7,000 | Holdrege-Hastings-Omaha | 10,600 |
| Fargo-Jamestown | 4,700 | Fairbury-Lincoln-Omaha | 7,100 |
| Great Falls-Havre | 4,700 | Rapid City-Gillette-Sheridan | 11,300 |
| Great Falls-Kalispell | 5,300 | Rapid City-Pine Ridge-Chadron-Scottsbluff | 9,300 |
| Great Falls-Shelby | 4,400 | | |
| Hastings-Omaha | 10,000 | Omaha-Norfolk-O'Neill-Ainsworth-Valentine | 11,500 |
| Huron-Sioux Falls | 6,400 | | |
| Kalispell-Spokane | 11,000 | | |

Table LIII identifies the projected savings in federal subsidy by implementing commuter service on those subsidized routes in the Old West Region that are assumed to be replaced in the recommended system. As can be seen from the table, a region-wide savings of $5.5 million is estimated with the added benefit of the commuter service providing equal or improved service.

## TABLE LIII. RECOMMENDED SYSTEM SUBSIDY SAVINGS

| Local Service Airline | Subsidized Local Service Route Segments Replaced | Subsidized Local Service Route Segments Not Replaced[a] | Local Service Subsidy for Replaced Segments (FY 1974) | | Projected Net Annual Economic Assistance Needs[b] of Recommended System |
|---|---|---|---|---|---|
| | | | Need | Paid | |
| Frontier | 39 | 15 | $3,273,000 | • Operating $2,220,000<br>• Station[c] 1,020,000<br>• Need Adj. (-10.31%) 334,000<br>Total $2,906,000 | $98,100 |
| North-Central | 14 | 6 | $2,112,000 | • Operating $1,295,000<br>• Station 660,000<br>• Need Adj. (+4.39%) 86,000<br>Total $2,041,000 | |
| Hughes Airwest | 2 | 0 | $ 277,000 | • Operating $ 366,000<br>• Station 120,000<br>• Need Adj. (+25.9%) 126,000<br>Total $ 612,000 | |
| Total | 55 | 21 | $5,662,000 | $5,559,000 | $98,100 |

[a] Principally local service negative need segments.

[b] 1975 mature demand with 12.35% average annual return on investment — total system implementation.

[c] Excludes stations outside region.

- Route Coupling Analysis

Reflecting the route coupling criteria and methodology discussed in the "Route Structure Analysis" section, Table LIV identifies the assignment of aircraft to the specific routes included in the recommended system to best provide satisfactory utilization. Identified in the table are 6 fifteen-passenger aircraft and 27 eight-passenger aircraft along with their annual utilization fraction. This fraction results from the yearly route block time divided by 2500 hours per year, which was the base utilization assumed for the purposes of the economic analysis. Thus, a fraction of 1.0 would represent exactly 2500 hours yearly utilization on the assigned routes. As can be seen, this fraction varies from about 0.50 to over one. Whereas the fractions close to or over one are considered adequate, aircraft serving routes exhibiting fractions below 0.70 are recommended for consideration of additional off-route utilization. This recommendation is to preclude potential impacts of increased hourly operating costs at the lower utilization figures. On a system basis, however, the average .94 utilization fraction for the fifteen-passenger aircraft and the .83 average utilization factor for the eight-passenger aircraft are considered acceptable. They represent the best coupling combination and aircraft assignment in view of the varying capacity needs, geographic locations, and scheduling needs while still providing early morning service from the outlying communities and return service the same day.

TABLE LIV. AIRCRAFT ASSIGNMENT AND UTILIZATION SUMMARY

| Aircraft | Aircraft Size | Service Points | Annual Utilization Fraction[a] |
|---|---|---|---|
| B-1 | 15 Passenger | Kalispell-Spokane | 1.31 |
| B-2 | 15 Passenger | Missoula-Butte-Billings | 1.28 |
| B-3 | 15 Passenger | Sheridan-Billings | 1.07 |
| B-4 | 15 Passenger | Cody-Worland-Casper | 1.02 |
| B-5 | 15 Passenger | Aberdeen-Sioux Falls | 0.58[c] |
| B-6[b] | 15 Passenger | Kalispell-Great Falls | 0.37 |
|  |  | Average | 94% |
| C-1 | 8 Passenger | Shelby-Great Falls<br>Havre-Great Falls | 0.68 |
| C-2 | 8 Passenger | Wolf Point-Glasgow-Billings | 0.81 |
| C-3 | 8 Passenger | Williston-Sidney-Billings | 1.01 |
| C-4 | 8 Passenger | Glendive-Miles City-Billings | 0.74 |
| C-5 | 8 Passenger | Dillon-Butte-Billings | 0.81 |
| C-6 | 8 Passenger | Rapid City-Gillette-Sheridan<br>Sheridan-Billings | 1.06 |
| C-7 | 8 Passenger | Rock Springs-Casper<br>Gillette-Casper | 0.88 |
| C-8 | 8 Passenger | Saratoga-Rawlins-Casper | 0.49[c] |
| C-9 | 8 Passenger | Saratoga-Laramie-Denver<br>Laramie-Denver | 0.83 |
| C-10 | 8 Passenger | Wheatland-Cheyenne<br>Torrington-Cheyenne | 0.49[c] |
| C-11 | 8 Passenger | McCook-Denver | 0.70 |
| C-12 | 8 Passenger | McCook-Kearney-Omaha | 0.77 |

[a] Fraction of yearly route block time over 2500 hrs/yr.

[b] Coupled with B-1.

[c] Off-route utilization highly desirable.

## TABLE LIV. AIRCRAFT ASSIGNMENT AND UTILIZATION SUMMARY (Cont.)

| Aircraft | Aircraft Size | Service Points | Annual Utilization Fraction[a] |
|---|---|---|---|
| C-13 | 8 Passenger | Holdrege-Hastings-Omaha<br>Fairbury-Lincoln-Omaha | 1.16 |
| C-14 | 8 Passenger | Hastings-Omaha<br>Norfolk-Omaha | 1.19 |
| C-15 | 8 Passenger | Broken Bow-North Platte<br>Broken Bow-Columbus-Omaha | 0.93 |
| C-16 | 8 Passenger | Valentine-Ainsworth-O'Neill-Norfolk-Omaha | 1.06 |
| C-17 | 8 Passenger | Winner-Mitchell-Sioux Falls<br>Yankton-Sioux Falls | 0.76 |
| C-18 | 8 Passenger | Huron-Sioux Falls<br>Watertown-Sioux Falls<br>Brookings-Sioux Falls | 0.79 |
| C-19 | 8 Passenger | Bismarck-Pierre | 0.82 |
| C-20 | 8 Passenger | Pierre-Lincoln | 1.08 |
| C-21 | 8 Passenger | Grand Forks-Devils Lake-Bismarck | 0.60 |
| C-22 | 8 Passenger | Dickinson-Bismarck | 0.84 |
| C-23 | 8 Passenger | Stanley-Minot-Bismarck | 1.20 |
| C-24 | 8 Passenger | Ogallala-Sidney-Denver | 0.70 |
| C-25 | 8 Passenger | Rapid City-Pine Ridge-Chadron-Scottsbluff<br>Alliance-Scottsbluff | 0.86 |
| C-26 | 8 Passenger | Jamestown-Fargo-Grand Forks | 0.60 |
| C-27 | 8 Passenger | Kemmerer-Evanston-Salt Lake City | 0.48[c] |
|  |  | Average | 0.83% |

[a] Fraction of yearly route block time over 2500 hrs/yr.

[c] Off-route utilization highly desirable.

- Airport Needs

The airport needs associated with the recommended system are identified in Table LV. It identifies the airports at communities remaining in the system for which improvement are required to meet the minimum commuter airport criteria discussed in the "Airport Requirements" section. Whereas aircraft off-loading is recommended where minor runway length problems appear, some of these airports will require the addition of instrument approach aids, lighting aids, and terminal facilities. It is then assumed that where instrument approach aids are needed that a non-directional beam (NDB) will be sufficient and that mobile terminal facilities will suffice where terminal facilities are required. Table LVI identifies the airport improvement cost estimates that were used to analyze the required costs of providing the necessary improvements. The estimates represent a composite of costs for airport facilities and equipment in the Western United States. Table LVII summarizes the airport improvement costs by state and further separates these costs into eligible and ineligible for 75 percent federal share-funding under the federal Airport Development Aid Program (ADAP). It should be noted that current ADAP legislation in process may change the assumed eligibility, but, pending Congressional passage of the current legislation, the original ADAP eligibility ground rules were used. In view of these ground rules, the ADAP ineligible items noted are principally the costs of adding mobile terminal facilities. A total cost of $560,000 will be required within the Old West Region with $492,000 considered ADAP eligible and $68,000 ADAP ineligible. Savings, however, can be realized at some airports that would no longer require extensive development to accommodate certificated air carrier jet aircraft in order to retain, or obtain, scheduled air service.

## Table LV. RECOMMENDED SYSTEM AIRPORT NEEDS

| State/ Community | Airport | Required Improvements | | | | | |
|---|---|---|---|---|---|---|---|
| | | Largest Recommended Aircraft Size (Pass.) | Instrument Approach Aids | Runway Lights | Rotating Beacon | Terminal Facilities | Runway Length/Aircraft Requirements (Full Fuel Load, 100° OAT[a]) |
| Montana | | | | | | | |
| Dillon | | 8 | | MIRL's req'd | | Mobile facilities req'd | 8 pass. A/C limited to 50% load factor |
| Nebraska | | | | | | | |
| Broken Bow | (Municipal) | 8 | | | | | A/C limited to 50% load factor |
| Fairbury | (Municipal) | 8 | NDB req'd | | | | A/C limited to 75% load factor |
| Ogallala | Searle Field | 8 | | MIRL's req'd | | | |
| O'Neill | (Municipal) | 8 | | | | | A/C limited to 50% load factor |
| North Dakota | | | | | | | |
| Stanley | (Municipal) | 8 | NDB req'd | MIRL's req'd | | Mobile facilities req'd | A/C limited to 50% load factor |
| South Dakota | | | | | | | |
| Pine Ridge | Tribe | 8 | NDB req'd | | | Mobile facilities req'd | |
| Wyoming | | | | | | | |
| Evanston | (Municipal) | 8 | NDB req'd | | | Mobile facilities req'd | 8 pass. A/C limited to 75% load factor |
| Kemmerer | (Municipal) | 8 | NDB req'd | MIRL's req'd | Beacon req'd | Mobile facilities req'd | |
| Saratoga | Shively Field | 8 | NDB req'd | MIRL's req'd | | | |
| Torrington | (Municipal) | 8 | NDB req'd | | | Mobile facilities req'd | |
| Wheatland | Phifer Airfield | 8 | NDB req'd | | | Mobile facilities req'd | |

[a] Outside Air Temperature

## TABLE LVI. AIRPORT IMPROVEMENT COST ESTIMATES

○ RUNWAY EXTENSIONS

| | | | |
|---|---|---|---|
| CLEAR | $5/LINEAR FOOT | | (GU RUNWAY) |
| GRADING | $66 | " | " |
| DRAINAGE | $30 | " | " |
| MULCH | $11 | " | " |
| PAVING | $41 | " | " |
| | $153 | | |

○ MEDIUM INTENSITY RUNWAY LIGHTS

$13/RUNWAY FOOT (FAA STANDARDS)

○ 2-BAR VASI(1)

$6,000

○ ROTATING BEACON

$2,500

○ NON-DIRECTIONAL BEACON

$7,000 (INSTALLED)

○ TERMINAL FACILITIES

| | |
|---|---|
| 700 SQ FT TRAILER - | $ 6,000 |
| FURNISHINGS & MISC. - | 3,000 |
| WEATHER OBSERVATION EQUIPMENT & PERSONNEL TRAINING - | 1,000 |
| | $ 10,000 |

(1) COUPLE WITH MIRL'S FOR ADAP FUNDING PURPOSES

# TABLE LVII. AIRPORT IMPROVEMENT COSTS

| State/ Community | Airport Name | Improvement Costs | | |
|---|---|---|---|---|
| | | ADAP Eligible ($) | ADAP Ineligible ($) | Total ($) |
| Montana | | | | |
| Dillon | | 58,000 | 10,000 | 68,000 |
| TOTAL | | 58,000 | 10,000 | 68,000 |
| Nebraska | | | | |
| Broken Bow | (Municipal) | – | – | – |
| Fairbury | (Municipal) | 7,000 | – | 7,000 |
| Ogallala | Searle Field | 64,500 | – | 64,500 |
| O'Neill | (Municipal) | – | – | – |
| TOTAL | | 71,500 | – | 71,500 |
| North Dakota | | | | |
| Stanley | (Municipal) | 54,600 | 10,000 | 64,600 |
| TOTAL | | 54,600 | 10,000 | 64,600 |
| South Dakota | | | | |
| Pine Ridge | Tribe | 7,000 | 10,000 | 17,000 |
| TOTAL | | 7,000 | 10,000 | 17,000 |
| Wyoming | | | | |
| Evanston | (Municipal) | 78,000 | 10,000 | 88,000 |
| Kemmerer | (Municipal) | 87,650 | 10,000 | 97,650 |
| Saratoga | Shively Field | 122,200 | – | 122,200 |
| Torrington | (Municipal) | 7,000 | 10,000 | 17,000 |
| Wheatland | Phifer Airfield | 7,000 | 10,000 | 17,000 |
| TOTAL | | 301,850 | 40,000 | 341,850 |

- GENERAL
- ECONOMIC SUPPORT OPTIONS
- REGULATORY AND INSTITUTIONAL REQUIREMENTS
- ALTERNATIVE IMPLEMENTATION TECHNIQUES
- IMPLEMENTATION ACTIVITIES

# COMMUTER SYSTEM IMPLEMENTATION

- General

Implementation of an effective commuter air service system will require a coordinated effort at the federal, regional, state, and local levels. The implementation methods and techniques must necessarily be accomplished within an integrated policy framework established by the respective states. This section addresses a number of economic support options, alternative implementation techniques, regulatory and institutional considerations, and overall implementation activities that are considered appropriate for consideration in implementing a regional air service system.

- Economic Support Options

Table XLIX summarized the results of the economic analysis of the recommended commuter air service system. Although a number of routes are estimated to be profitable, some will require economic assistance in order to provide an operator with a break-even financial position or some return on investment. This is particularly true for the demand build-up period during the first year. There are a number of appropriate economic assistance options at the federal, regional, state, and local levels, as well as options open to an operator to further improve his economic position. (See Table LVIII.)

(1) Federal Assistance Options

Certain current and potential federal assistance options are considered applicable to the development of a commuter air service system for the Old West Region. Although the CAB provides subsidies to certificated local service carriers for many of the smaller markets in the region, they are currently precluded by law from providing economic assistance directly to commuter air carriers. However, in many areas of the country, commuter air carriers have been economically serving many small communities (without subsidy) under replacement agreements with certificated air carriers. Not only is the federal subsidy for these routes no longer required but also improved service frequencies usually result. Therefore, where even commuter service is economically marginal (but still considered necessary), methods to provide direct federal subsidies are considered appropriate for further investigation.

Such subsidies could take a number of forms. A flow-through subsidy experiment was implemented with Frontier Airlines acting as a subsidy recipient for commuter service to three Midwest communities and, in turn, passing this subsidy on to Air Midwest, the commuter air carrier. Recently, however, this concept was determined in the courts to be illegal under the current federal aviation laws and has since been discontinued. This action has

## TABLE LVIII. ECONOMIC ASSISTANCE OPTIONS

| Federal | Regional | State | Local | Operator |
|---|---|---|---|---|
| Commuter Air Carrier Limited Certification<br>Equipment Loan Guarantees<br>Mail Contracts<br>Federal Assistance Grants<br>Airport Class Redesignation | Contract Service<br>Assistance Payments to State/ Communities | State Employee Seat Guarantees<br>Cross-Subsidies<br>Assistance Payments to Communities<br>Contract Services<br>Airport Improvements<br>Tax Relief | Assistance Payments to Operator<br>Seat Guarantees<br>Non-business Travel Development<br>Promotional Assistance<br>Free Facilities and Services<br>Improved Airport Access<br>Local Tax Relief | Cargo Contracts<br>Interline Ticketing<br>Special Commercial Services<br>Emergency and Medical Contracts<br>Charter Services<br>Group Rates<br>Fixed Base Operator Agreements<br>Interline Connecting Agreements |

renewed interest in the concept of limited certification of commuter air carriers by the CAB. Although one commuter carrier, Air New England, recently applied for and received full certification, many commuter operators are concerned with the extensive regulation associated with such full certification. Limited certification, however, could be designed to provide the CAB with only those regulatory controls considered appropriate to smaller commuter air carriers yet enabling federal subsidy payments. A carrier could further have an option as to whether he would apply for such certification for serving nonregulated markets. Such an approach would not burden the commuter air carriers with inappropriate economic regulation yet would provide the CAB with the needed regulatory control. Limited certification could have the added advantage of providing a commuter air carrier with some degree of route protection as well as eligibility for capital equipment loan guarantees. One form of legislation to enable limited certification was introduced in Congress in 1972 but was not passed. At this time, however, it may be a more favorably considered option for assisting in providing air service to small communities.

Another form of economic assistance available from the federal government would be financial aid from, or through, the Old West Regional Commission. The Commission is in a position to understand the development needs and priorities of the region and is considered to be an appropriate agency to allocate federally available funds. Such funds could be made available from current budgets or from additional allocations that could be designated for this purpose as a result of new legislation. Precedences have been set for assistance from regional commissions, although on a smaller scale than would be required if a major commuter airline system were implemented in the Old West Region. The Coastal Plains Regional Commission has provided financial assistance through a contract with a commuter air carrier to provide rural air service at selected points in Georgia. Also, the Four Corners Regional Commission is currently providing financial aid to assist in continuity of commuter air service to selected communities in Arizona.

The federal government is currently financially participating in the development of airports in the Airport Development Aid Program (ADAP). This program provides significant financial assistance toward developing airports to meet minimum commuter requirements. To date, however, airports served by commuter air carriers have been grouped in the general aviation category with no separate distinction or priority where commuter air service may be the only scheduled air service available to a community. Recent legislation currently being considered by Congress does, however, recognize a distinct category of airports served by commuter air carriers with special federal funds available from the Administrator's discretionary funds. Such designation is considered a significant step in the right direction.

Further, the U.S. Postal Service also contracts for the delivery of mail in selected areas of the country not conducive to timely mail delivery by certificated air carriers or by surface means. Although of significant help to some operators as a revenue guarantee (as well as an opportunity to utilize their aircraft during off-peak hours), mail revenues for those carriers that also carry passengers is typically only about three percent of their total revenue.

(2) State Assistance Options

At the state level, potentially attractive support options include route awards based upon the cross-subsidy principle, contract service agreements, state employee seat guarantees, direct assistance payments to communities or operators, and continuing provision of funds to assist in the development of airports.

Regarding cross-subsidies, each state, or states, could qualify awards of potentially profitable routes with the condition that economically marginal routes also be served, which would assist in offsetting some of the financial needs of the marginal routes with the profits of the viable routes. Each state in the Old West Region has an agency currently empowered to regulate intrastate air service but only within their state. Thus, as interstate routes are involved, interstate agreements and cooperation would be required in order to effect implementation on a system basis.

Contract service agreements could also be affected with an operator or operators to provide the necessary service. North Dakota, for example, was investigating such a concept at one time. North Dakota's plan would call for a direct contract with an operator, which would specify certain routes and minimum service requirements as well as other appropriate criteria. Funding could come jointly from state and federal sources.

One assistance option that some states have found beneficial has been a state guarantee of a certain minimum number of passengers over a certain period of time. State employees are then encouraged to use the service in business travel. Many states have observed that air travel cannot only provide for more effective use of employee time and reduce per diem cost but could also conceivably reduce their car fleet expenses. Although of less value to states currently operating their own aircraft (which are made available to all state employees for business travel purposes), such a concept may be beneficial to states with fewer state-owned aircraft.

Another option, of course, is providing direct assistance payments to operators to provide the necessary service. A variation of this concept would be to provide the assistance payment to the community, which would then contract with the operator. This approach not only enhances community involvement in supporting the service but also gives them more of a voice in defining the required service characteristics.

Other options open to states where state-level taxes are imposed, would be to provide selected tax relief to an operator, in particular during the early travel demand build-up periods.

### (3) Local Assistance Options

Many of the options discussed at the state level are also, of course, open to communities on a smaller scale. Seat guarantees, service contracts, direct assistance payments to operators, and tax relief all could be implemented at the community level. Other less direct assistance options are also open to a community. These options include promotional assistance, the provision of free space at the community's airport, free or low-cost transportaion for passengers to and from the airport, and special package cargo contracts. Although labor and aircraft operating costs are the significant expenses to a commuter operator, these indirect support items can still help improve an operator's economic position. Additionally, as the majority of users of commuter air service are traditionally business travellers, a community can take appropriate promotional steps to enhance travel by non-business segments of the community. Although travel for recreational purposes, routine medical aid, cultural purposes, shopping, and visiting friends and relatives is usually by very cost-sensitive travellers, the community can encourage an operator to provide discount fares if such travel can occur during off-peak hours.

### (4) Operator Options

In addition to passenger revenues, there are also a number of assistance options open to the commuter operator that can contribute toward economic viability. Although most operators actively solicit cargo contracts, many will also provide mutually beneficial special services. One example is the flying of bank checks from outlying communities to central banking facilities in the larger communities. The reduced transport time can often be quite valuable to the bank. Many operators also provide charter services to enhance aircraft utilization when not flying scheduled routes, solicit emergency and medical service contracts, and provide special group rates to encourage non-business, off-peak travel. Another fundamental support aspect that most operators recognize is the need for inter-line agreements with certificated air carriers. As many of the commuter passengers wish to connect with a certificated air carrier at the larger communities, appropriate agreements to ensure through ticketing, baggage handling, etc., are considered essential. Many certificated air carriers also recognize the financial benefit of receiving passengers from the commuter airline and are willing to provide further assistance such as baggage handling services and equipment, free use of reservation systems, and joint fares.

- **Regulatory and Institutional Requirements**

The study included an examination of regulatory and other institutional requirements that will require consideration when implementing the air service system. Intrastate air service regulation and aviation taxation were the primary areas of investigation.

### (1) Aviation Regulation

The "Introduction and Background" section addressed the federal regulations imposed upon commuter air carriers by the CAB and the FAA. This section is thus concerned primarily with state-level regulation.

The principal features of intrastate air service regulation requirements appropriate to each state are shown in Table LIX. These requirements are related to route authority, applicability, route control, tariff and schedule reporting and control, insurance requirements, and reporting requirements. As can be seen from the table, all of the states either regulate, or are empowered to regulate, intrastate air service by non-certificated air carriers. Whereas the written regulations vary as to detail, it is clear that commuter air service implementation must consider and conform to these regulations. These would include the requirements for an operator to apply to the various aviation regulatory agencies for route authority. Such applications must typically include proposed route identification, proof of financial stability, statements of proposed service frequencies and schedules, identification of equipment to be used, proof of minimum insurance,(1) proposed tariffs, and other appropriate information as may be required by the regulatory agencies. Further, any changes to route service characteristics, tariffs, or other pertinent and related service features normally must be approved by or coordinated with these agencies.

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(1) Such insurance liability should not be a problem as all commuter air carriers are required to register with the CAB and provide proof of insurance. CAB-required minimum levels are identical to those required by the state of Nebraska.

# TABLE LIX. STATE REGULATORY REQUIREMENTS

| | Montana | Nebraska | North Dakota | South Dakota | Wyoming |
|---|---|---|---|---|---|
| Regulatory Agency | Board of Aeronautics | Nebraska Public Service Commission | North Dakota Aeronautics Commission | Aeronautics Commission | Public Service Commission |
| Authority | Sections 1-322 thru 1-324<br>Revised Codes of Montana | Section 75-201, R.R.S. 1943 and Chapter II of "Rules and Regulations of the Nebraska State Railway Commission" | Sections 2-05-15, 2-05-16 and 2-05-17 of the North Dakota Century Code | Chapters 50-2-5 and 50-2-10, South Dakota Laws | Chapter 8, Title 37, Wyoming Statutes |
| Applicability | Sched. common air carriers which operate in the state and do not have a federal cert. of public conven. & necessity | All commercial air carriers serving more than one point in the state-including unsched. air taxis and CAB certificated air carriers | Carriers operating aircraft on a definite schedule between fixed termini, within the state | Empowers Aeronautics Commission with discretional authority to regulate intrastate scheduled air service | Intrastate scheduled air service where the U.S. has not excluded regulation by states |
| Route Control | Certificate of public convenience & necessity req'd - public hearing $150 fee | Certificate of public convenience and necessity required-public hearing - $50 initial fee; $25 annually thereafter | Certificate of public convenience and necessity required - public hearing - $150 fee ($50 for transfer) | Authorized to require certificates and permits to institute service | Certificate of public convenience and necessity required - public hearing - no fee identified |
| Tariff & Schedule Control | Authorized to fix rates, fares, charges, classifications, and rules of carrier after public hearing. | Commission retains right to regulate tariff filing, publishing and posting. Requires availability at ticket sales locations and in aircraft. Schedules must be filed with commission with seven days notice for changes | Tariffs must be filed with commission. | Authorized to regulate tariffs, rates, and service | None |
| Minimum Insurance Requirements | May, after hearing, require as determined by Board | Passenger liability - $75,000/pass; $75,000 times 75% of no. of aircraft seats per occurrence<br>Non-pass liability - $75,000/person, $300,000/occurrence<br>Property damage - $100,000/occurrence | None | None | None |
| Periodic Reporting Requirements | Annual financial reports & "other data" as required by the Board | Annual financial and gross intrastate operating revenue reports required. Accident reports | No post application requirements | None | None |
| Merger/Financial Controls | Board may "regulate the account of each carrier" | None | None | None | None |

One purpose in examining intrastate regulatory requirements was to identify any apparent inconsistencies between states that may potentially inhibit implementation of commuter air service. Based upon the current written requirements as well as the stated practices by the regulatory agencies, there do not appear to be any major inconsistencies from state to state. However, if a state intends to amplify current requirements, it is recommended that a review be made of other state practices in the region to preclude any inconsistences that may have a bearing on an operator's willingness or ability to serve the region.

### (2) Aviation Taxation

Another area addressed in the study was the examination of federal and state aviation taxes imposed on air carriers. The purpose of this examination was (1) to identify taxation costs that are appropriate to current or potential commuter aircraft carriers, and (2) to provide possible funding sources where economic assistance may be required to implement a route.

At the federal level, both certificated air carriers and commuter air carriers are exempt from fuel taxes. They are required, however, to pay a use tax and ticket tax as follows:

- Each certificated and commuter air carrier must pay a federal use tax on piston aircraft of $24 (up to 2500 pounds gross weight) plus 2¢ per pound for the gross weight above 2500 pounds. Operators of turbine aircraft must pay $25 per aircraft plus 3.5¢ per pound gross weight.

- Both certificated and commuter air carriers must pay a tax of 8 percent of each ticket sold plus 5 percent of their cargo tariff.

These funds are deposited in the Aviation Trust Fund and are used for further development of the National Airway System.

Tables LX through LXIV identify the state aviation taxes imposed upon certificated air carriers, commuter air carriers, and general aviation along with the collection agency, the end use, and the amount collected in FY 1974 (as available). As can be seen, these taxes include fuel taxes, aircraft and pilot registration fees, airline flight property tax, and sales and use tax. The amounts vary from state to state and, in some cases, result in the collected taxes not necessarily being dedicated to aviation use. Such nondedicated tax categories include airline flight property tax, sales and use tax, and, in some cases, registration fees. Whereas it is recognized that each individual state will have its priorities for use, the dedication of such aviation revenues to aviation purposes is recommended for consideration.

## TABLE LX. MONTANA STATE AVIATION TAXES

| | CAB CERTIFICATED AIR CARRIERS | COMMUTER AIR CARRIERS | GENERAL AVIATION | COLLECTING AGENCY | USE | AMOUNT FY 1974 |
|---|---|---|---|---|---|---|
| FUEL | | | | | | |
| AVIATION GAS | 1¢/gal | 1¢/gal | 1¢/gal | DIV OF AERO | DIV OF AERO | NOT AVAIL |
| JET FUEL | 1¢/gal | 1¢/gal | 1¢/gal | DIV OF AERO | DIV OF AERO | NOT AVAIL |
| REGISTRATION FEES (1) | | | | | | |
| AIRCRAFT | | | $1.00 (2) | DIV OF AERO | DIV OF AERO | NOT AVAIL |
| PILOT | | | 1.00 | DIV OF AERO | DIV OF AERO | NOT AVAIL |
| AIRLINE FLIGHT PROPERTY TAX | (3) | | | | | |
| SALES AND USE TAX | NONE | | | | | |
| AIRCRAFT PURCHASE | | | | | | |
| AIRCRAFT RENTAL, REPAIR, AND PARTS | | | | | | |

(1) Used for search and rescue

(2) Being increased to $10.00 per aircraft 1 Jan 1976

(3) To be imposed 1 Jan 1976

## TABLE LXI. NEBRASKA STATE AVIATION TAXES

| | CAB CERTIFICATED AIR CARRIERS | COMMUTER AIR CARRIERS | GENERAL AVIATION | COLLECTING AGENCY | USE | AMOUNT FY 1974 |
|---|---|---|---|---|---|---|
| FUEL (1) | | | | | | |
| AVIATION GAS | 5¢/gal | 5¢/gal | 5¢/gal | DEPT OF REV | DEPT OF AERO | $958,000 (2) |
| JET FUEL | 5¢/gal | 5¢/gal | 5¢/gal | DEPT OF REV | DEPT OF AERO | |
| REGISTRATION FEES | NONE | | | | | |
| AIRCRAFT | | | | | | |
| PILOT | | | | | | |
| AIRLINE FLIGHT PROPERTY TAX | (3) | | | TAX COMM | COUNTY GENERAL FUND | 191,177 |
| SALES AND USE TAX | | | | | | |
| AIRCRAFT PURCHASE | 2-1/2% | 2-1/2% | 2-1/2% | DEPT OF REV | GENERAL FUND | NOT AVAIL |
| AIRCRAFT RENTAL, REPAIR, AND PARTS | 2-1/2% | 2-1/2% | 2-1/2% | DEPT OF REV | GENERAL FUND | NOT AVAIL |

(1) 2-1/2¢/gal refund available on application, full rebate to qualified aviation schools

(2) Less 1 percent to General Fund

(3) Computed by an average of airline arrivals and departures, revenue tons, and originating revenue in Nebraska in relation to total system

## TABLE LXII. NORTH DAKOTA STATE AVIATION TAXES

| | CAB CERTIFICATED AIR CARRIERS | COMMUTER AIR CARRIERS | GENERAL AVIATION | COLLECTING AGENCY | USE | AMOUNT FY 1974 |
|---|---|---|---|---|---|---|
| FUEL | | | | | | |
| AVIATION GAS | 7¢/gal | 7¢/gal | 7¢/gal | STATE TAX DEPT | AERO COMM(2) | $60,000 |
| JET FUEL | 7¢/gal | 7¢/gal | 7¢/gal | STATE TAX DEPT | AERO COMM(2) | NEGLIGIBLE |
| REGISTRATION FEES | | | | | | |
| AIRCRAFT | | | (3) | AERO COMM | (4) | 28,436 (5) |
| PILOT | | | $3.00 (6) | AERO COMM | GENERAL FUND | 7,500 |
| AIRLINE FLIGHT PROPERTY TAX | (7) | | | STATE TAX DEPT | COMMUNITIES | 275,000 |
| SALES AND USE TAX | | | | | | |
| AIRCRAFT PURCHASE | 4% | 4% | 4% | STATE TAX DEPT | GENERAL FUND | NOT AVAIL |
| AIRCRAFT RENTAL, REPAIR, AND PARTS | 4% | 4% | 4% | STATE TAX DEPT | GENERAL FUND | NOT AVAIL |
| EXCISE TAX ON FUEL (8) | | | | | | |
| AV GAS | 4% | 4% | 4% | STATE TAX DEPT | AERO COMM | 25,000 |
| JET FUEL | 4% | 4% | 4% | STATE TAX DEPT | AERO COMM | 175,000 |

(1) 7¢/gal refund less excise tax available upon application (unrefunded amount shown)
(2) Used for development of state airports
(3) Based on depreciated value (50% minimum) and weight
(4) 25% to General Fund, 75% to public airports in counties where fees originate
(5) Includes $4,300 from crop spraying aircraft
(6) Two year fee period
(7) Allocated to communities receiving service on basis of number of landings and gross weight-tax collected from 3 airlines and distributed to airport authorities in 7 communties
(8) 100% for matching funds for public airport development

## TABLE LXIII. SOUTH DAKOTA STATE AVIATION TAXES

| | CAB CERTIFICATED AIR CARRIERS | COMMUTER AIR CARRIERS | GENERAL AVIATION | COLLECTING AGENCY | USE (3) | AMOUNT FY 1974 |
|---|---|---|---|---|---|---|
| FUEL (1) | | | | | | |
| AVIATION GAS | 4¢/gal | 4¢/gal | 4¢/gal | DEPT OF REV | LOCAL AIRPORTS | $101,522 |
| JET FUEL | 4¢/gal | 4¢/gal | 4¢/gal | DEPT OF REV | LOCAL AIRPORTS | 281,383 |
| REGISTRATION FEES | | | | | | |
| AIRCRAFT | | | $10-100 | AERO COMM | GENERAL FUND | 18,245 |
| PILOT | | | $1.00 | AERO COMM | GENERAL FUND | 1,806 |
| AIRLINE FLIGHT PROPERTY TAX | (2) | | | DEPT OF REV | LOCAL AIRPORTS | 122,758 |
| SALES AND USE TAX | | | | | | |
| AIRCRAFT PURCHASE | 4% | 4% | 4% | AERO COMM | GENERAL FUND | 107,714 |
| AIRCRAFT RENTAL, REPAIR, AND PARTS | 4% | 4% | 4% | DEPT OF REV | GENERAL FUND | NOT AVAIL |

(1) Tax refund according to annual quantity:

| Annual Purchase (gallons) | Tax Rebate (¢/gal) |
|---|---|
| 0-100,000 | None |
| 100,000-200,000 | 1¢ |
| 200,000-400,000 | 2¢ |
| Over 400,000 | 3¢ |

(2) Computed using a state usage formula, the depreciation value of the airline's aircraft, and the state tax rate. Statue usage is based on the average of the airline's total tonnage, hours flown and route miles in South Dakota in relation to its total system. Assessment rate is 60 percent of depreciated value taxed at a rate of 53.17 mills

(3) 0.033¢ Local Airports
0.0058¢ Aero Comm
0.0088¢ Local Airports (after refund)

## TABLE LXIV. WYOMING STATE AVIATION TAXES

| | CAB CERTIFICATED AIR CARRIERS | COMMUTER AIR CARRIERS | GENERAL AVIATION | COLLECTING AGENCY | USE | AMOUNT FY 1974 |
|---|---|---|---|---|---|---|
| FUEL (1) | | | | | | |
| AVIATION GAS | 4¢ / gal | 4¢ / gal | 4¢ / gal | EXCISE TAX DIV | AERO COMM | $285, 444 |
| JET FUEL | 4¢ / gal | 4¢ / gal | 4¢ / gal | EXCISE TAX DIV | AERO COMM | |
| REGISTRATION FEES | | | NONE | | | |
| AIRCRAFT | | | | | | |
| PILOT | | | | | | |
| AIRLINE FLIGHT PROPERTY TAX | | | NONE | | | |
| SALES AND USE TAX (2) | | | | | | |
| AIRCRAFT PURCHASE | 3% | 3% | 3% | EXCISE TAX DIV | GENERAL FUND(3) | NOT AVAIL |
| AIRCRAFT RENTAL, REPAIR, AND PARTS | 3% | 3% | 3% | EXCISE TAX DIV | GENERAL FUND(3) | NOT AVAIL |

(1) 2¢/gal refund for 10,000 or over gal/month purchases

(2) 4 counties impose additional 1% tax

(3) Shared with local government

- Alternative Implementation Techniques

Alternative methods and techniques that could be used to assist in implementing a commuter air service system were investigated. Ideally, special methods and techniques to implement air service should not be required. Commuter operators are normally eager to enter any market that has a reasonable profit potential. However, service to many of the deserving communities in the Old West Region is estimated to be economically marginal--in particular during the first-year demand build-up periods. In order to ensure implementation of service to these communities, it may be necessary to consider the establishment of special organizational entities and implementation methods as well as provisions for economic support as discussed above. The total recommended commuter system includes interstate routes and may involve federal funding as one economic assistance form. Thus, it may be desirable to establish a multi-state organization to act as a focal point for financial and regulatory controls or, in the extreme, to own and operate a regional airline in actuality.

Six different implementation options were addressed. Each of these options is considered appropriate at any level of system implementation. That is, if the entire recommended commuter air service system were implemented as a single entity, the features, advantages, and disadvantages of each technique apply. If only portions of the system are ultimately implemented within a state or selected group of states (or even a community), the same features and the resultant advantages and disadvantages are still applicable. The six implementation methods and techniques investigated, their principal features, and advantages and disadvantages are summarized in Table LXV and described in the following paragraphs.

(1) Regional Route Contract

This concept would involve a state, multi-state, or regional organization contracting with a single operator (or organization of operators) to serve

TABLE LXV. ALTERNATIVE IMPLEMENTATION METHODS

| Implementation Method | Advantages | Disadvantages |
|---|---|---|
| State /Multi-State Route Contract | | |
| RFP--for system<br>Bidders respond with proposals for system or segments including cost bids for service<br>All excess revenues to state but<br>Profit sharing with operators for revenue in excess of bid baseline<br>Contract negotiated with limited renegotiation clause | Establishes minimum criteria<br>Prevents buy-in<br>Offers operator incentives for improved service<br>Recognizes that lowest bidder may not be best buy<br>Encourages innovations of operator<br>Renegotiation permits experimentation<br>Has built-in cross subsidy<br>Potential for service responsive to public needs<br>Furthers private enterprise | More difficult to select operator<br>Requires more government monitoring consultation<br>Possibly more costly than bidding<br>Could tend to fragment system (but to lesser degree than bidding) |
| State /Multi-State Route Bidding (Similar to Postal Service) | | |
| Route oriented<br>Minimum criteria for bidders<br>Requires performance bond<br>Lowest bidder wins<br>No renegotiation after contract award | Obtain least expensive service<br>Prevents buy-in<br>Offers operator incentives for improved service<br>Furthers private enterprise | May not obtain best buy service<br>Does not facilitate operator innovations<br>Inflexible during contract period discouraging experimentation<br>Prevents cross-subsidy<br>Tends to fragment system |

TABLE LXV. ALTERNATIVE IMPLEMENTATION METHODS (Cont.)

| Implementation Method | Advantages | Disadvantages |
|---|---|---|
| State /Multi-State Owned Airline | | |
| State owns and operates airline system | Permits experimentation<br>Provides for cross subsidy<br>Potential for service responsive to public needs<br>Provides potential for economies resulting from commonality | Extensive legislative implementation<br>Increased government involvement<br>Government competition with private enterprise<br>Lack of profit motive may result in uneconomical operation<br>Creates new airline instead of using existing operators |
| Quasi-Public Corporation (similar to AMTRAK Corp.) | | |
| Established by government<br>Some government representation on Board of Directors<br>Necessary subsidy budgeted | Profit motivated<br>Economies of scale<br>Permits integrated system<br>Basically a private enterprise<br>Experimentation possible<br>Permits cross subsidy of routes<br>Incentives for improved service<br>Potentially responsive to public needs | Extensive legislative implementation<br>Creates new airline instead of using existing operators |

TABLE LXV. ALTERNATIVE IMPLEMENTATION METHODS (Cont.)

| Implementation Method | Advantages | Disadvantages |
|---|---|---|
| State Lease of Aircraft | | |
| State buy aircraft and lease to operator | May free operator capital for other purposes<br>May obtain aircraft more inexpensively through economies of scale<br>Uses current operators | Lease agreements may have restrictions on use other than airline operations<br>Could result in use of inappropriate aircraft on some routes<br>Places government in competition with private enterprise |
| Reservation, Ticketing, Flight Information Subsystem Contract | | |
| Contract with established firm (e.g., travel agency) for required services<br>Agency may be selected by low bid<br>Must meet specified service criteria | Relieves operator of some costly functions<br>Permits economies of scale<br>May permit use of state computer system<br>Potential for better service to public<br>Avoids duplication<br>Permits standardized operations<br>Potential for improved public relations | Gives a franchise to selected agency which may be subject to interpretation by competing agencies as unfair<br>Operators may object to loss of control |

the entire commuter air service network. This contract could specify routes, service points, minimum service frequencies, time-of-day schedule requirements (if important for connecting service), and maximum fare levels. Such a contract could involve competitive bid procedures but could also have features indicating that all excess revenues over a fair return on investment be returned to the state. In order to give the operator incentive, however, it could include profit-sharing features for appropriate return of part of the revenue in excess of the bid baseline. Such a contract could also include a limited capability for renegotiation if service experimentation is desired.

The advantages of such a method would include the following:

- Controls against an operator buying in by originally underbidding in the hopes of renegotiating during the term of the contract
- Has allowances for competitive bidding
- Provides for appropriate operator incentives
- Allows selected experimentation
- Provides for the full potential of cross-subsidization as profitability would be determined on a system basis.

Another distinct advantage would be single-airline recognition throughout the entire region. This method's disadvantages include the difficulty in finding qualified operators willing or capable of serving the entire system. It further requires significant governmental or regional organization involvement for regulatory and financial monitoring.

### (2) Selective Route Contracts

This method is similar to the methods used by the U.S. Postal Service for contracting with carriers to deliver mail on particular route segments. Individual routes would be advertised for bid with certain minimum qualifications and service criteria specified. The lowest qualified bidder would be awarded the contract. This approach has the advantage of obtaining the least cost service and through non-renegotiation clauses, discouraging buying in. Its disadvantages, however, include the fact that the lowest bidder, although meeting the minimum qualifications, may not be the most qualified to provide service. Further, contracting on an individual route basis would preclude full benefits of cross-subsidy and could tend to fragment the system. It is, also, inflexible during the contract period, thus discouraging experimentation to improve service or ultimate profitability.

### (3) Regional Airline Ownership

This method would involve the actual ownership and operation of the entire airline system by the state or multi-state organization. Advantages of this option are that it provides a good potential for cross-subsidy and features that could allow experimentation, facilitates economy of scale consideration, and could be more responsive to public service needs than a private organization. Disadvantages include the problems of government competition with private enterprise, extensive government day-to-day involvement, and extensive legislation for implementation, as well as not taking advantage of the experience of existing operators in the region and possibly resulting in less of a profit motive than with a private organization.

### (4) Quasi-Public Corporation Operation

This method would involve the establishment of a quasi-public corporation (similar to Amtrak) to operate the air service system. The advantages of such an approach include system operation by a profit-motivated organization and facilitation of cross-subsidy and economies of scale. Experimentation would be possible and appropriate incentives for improved service could be realized. Its disadvantages, however, include the extensive legislative and institutional considerations involved as well as not necessarily taking advantage of the experience of existing operators.

### (5) Lease of Aircraft

This method involves the acquisition of aircraft by a state or multi-state organization and, in turn, leasing them to an operator or operators. It would enable a state to obtain aircraft perhaps more inexpensively based on economies of scale as well as solving one predominant problem that most commuters experience--that of inadequate capitalization to purchase aircraft. Its disadvantages include governmental competition with private enterprise as well as the possibility of inappropriate matching of aircraft on some routes as economies of scale may encourage purchase of a single type of aircraft to serve the whole region.

### (6) Provision of Selected Operational Services

This method involves the contracting by the state or multi-state organization for the provision of selected reservation, ticketing, and flight information services from a single agency to serve the entire regional system. This concept would have the advantages of relieving the operators from a number of costly functions, providing for economies of scale by contracting on a regional basis, preventing duplication, and perhaps permitting use of existing government equipment (e.g., computer systems). Its disadvantages include possible operator objections as they would have less control over the conduct of many of these fundamental airline activities.

Final selection of the most appropriate implementation techniques for the Old West Region is, of course, dependent upon the coordinated development of service policies and priorities by the communities and the five states in the region. Although the above options investigated present only a few of the possible implementation methods, each appears to warrant consideration should appropriate voluntary market entry by qualified operators not occur.

- Implementation Activities

The previous pages identified a number of economic assistance options, institutional considerations, and possible system implementation techniques. The specific nature of the implementation activities related to these options will vary considerably depending upon whether implementation is on a total system basis or, alternatively, for only a portion of the system. However, there are certain primary activities that will be required, independent of the detailed implementation methods ultimately selected. Figure 24 illustrates these actions, which are described more fully in the following paragraphs, and identifies the general activity required as well as recommended participants in accomplishing the action.

(1) Publicize Study Results Within Region

One of the first activities suggested is the proper distribution of the results of this study to appropriate governmental agencies, communities, and operators. The study data provides information regarding suggested route structures, aircraft, service levels, and economic needs, and can be used to communicate an understanding of the nature and costs of the proposed service. Such communication could also solicit information responses from candidate communities and provide a measure of their respective attitudes and interest regarding new or improved air service. Recommended action agencies to accomplish this activity include the Old West Regional Commission, state aviation officials, the governors, and appropriate community leaders.

(2) Define Implementation Policies

Concurrent with the distribution of the study results, appropriate implementation policies should be established by each state and appropriately coordinated at the regional level. Such policies should address the various implementation techniques and economic assistance methods and techniques that are considered to be the most desirable to pursue. These policies would provide a framework for selecting and pursuing the most appropriate methods. Should early

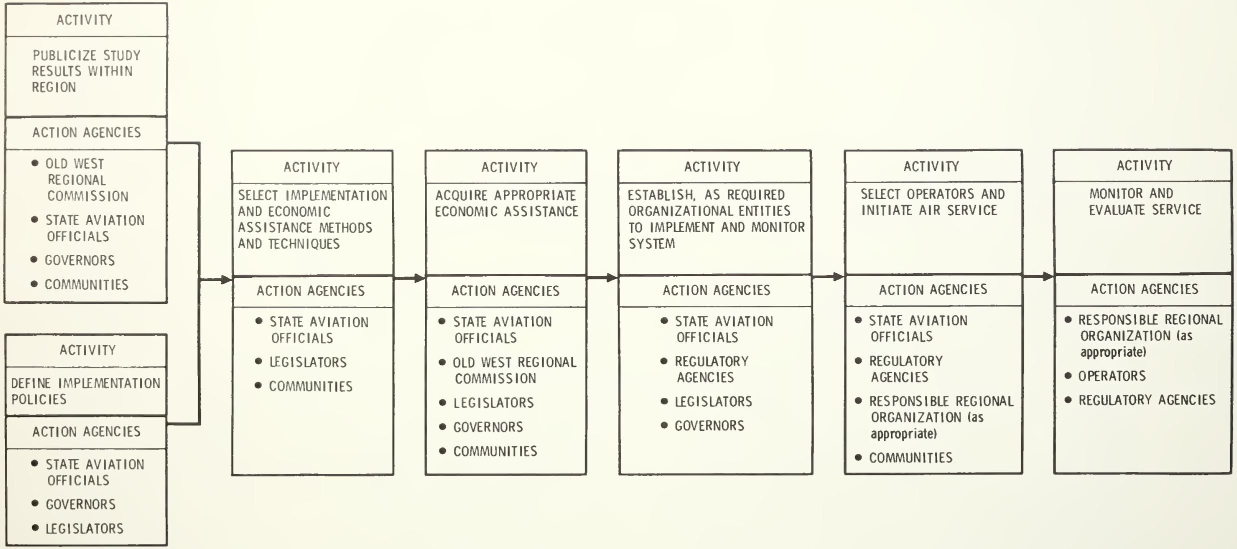

ACTIVITY
PUBLICIZE STUDY RESULTS WITHIN REGION
ACTION AGENCIES
• OLD WEST REGIONAL COMMISSION
• STATE AVIATION OFFICIALS
• GOVERNORS
• COMMUNITIES
ACTIVITY
DEFINE IMPLEMENTATION POLICIES
ACTION AGENCIES
• STATE AVIATION OFFICIALS
• GOVERNORS
• LEGISLATORS
ACTIVITY
SELECT IMPLEMENTATION AND ECONOMIC ASSISTANCE METHODS AND TECHNIQUES
ACTION AGENCIES
• STATE AVIATION OFFICIALS
• LEGISLATORS
• COMMUNITIES
ACTIVITY
ACQUIRE APPROPRIATE ECONOMIC ASSISTANCE
ACTION AGENCIES
• STATE AVIATION OFFICIALS
• OLD WEST REGIONAL COMMISSION
• LEGISLATORS
• GOVERNORS
• COMMUNITIES
ACTIVITY
ESTABLISH, AS REQUIRED ORGANIZATIONAL ENTITIES TO IMPLEMENT AND MONITOR SYSTEM
ACTION AGENCIES
• STATE AVIATION OFFICIALS
• REGULATORY AGENCIES
• LEGISLATORS
• GOVERNORS
ACTIVITY
SELECT OPERATORS AND INITIATE AIR SERVICE
ACTION AGENCIES
• STATE AVIATION OFFICIALS
• REGULATORY AGENCIES
• RESPONSIBLE REGIONAL ORGANIZATION (as appropriate)
• COMMUNITIES
ACTIVITY
MONITOR AND EVALUATE SERVICE
ACTION AGENCIES
• RESPONSIBLE REGIONAL ORGANIZATION (as appropriate)
• OPERATORS
• REGULATORY AGENCIES

Figure 24. Implementation Activities

implementation of the total system not be the course of action to be pursued, such policies should provide a framework for implementing the various segments of the system. In this latter case, the policies should address such issues as community eligibility criteria and service priorities, economic assistance shares and allocations, types and forms of state and regional support, and types and forms of intra-regional funding sources. Suggested action agencies for this task include state aviation officials and the respective state's legislators and governors.

### (3) Select Implementation and Economic Assistance Methods and Techniques

This activity would involve the actual selection and coordination of the economic assistance and implementation means within the policy framework defined in the previous activity. Again, appropriate action agencies include the state aviation officials and legislators with appropriate participation by the affected communities regarding their desires and contributions.

### (4) Acquire Appropriate Economic Assistance

Upon determination of the economic assistance sources to be pursued, actions to obtain such assistance must be then at the appropriate federal, state, and community levels. Even should federal funding be the desired course of action to be pursued, the exploration of supplementary assistance at the state and local levels is still considered appropriate. As a minimum, such discussions at the local level are considered necessary to enhance interest and support of the air service once the system is implemented. Recommended action agencies to accomplish this activity include the Old West Regional Commission, Congressional delegations, state legislators and governors, and state aeronautics officials.

### (5) Establish Organizational Entities to Implement and Monitor the System

Depending upon the implementation and economic assistance techniques ultimately selected, it may be necessary to establish an appropriate regional or state organization to monitor and fund the system properly. At the regional level, multi-state compacts or similar implementing agreements must be effected, organizational structures established, and operation and funding agreements developed. Action agencies recommended to accomplish the establishment of such an organization include the respective state aviation officials, legislators, governors, and intrastate air services regulatory agencies.

### (6) Select Operators and Initiate Air Service

As it is expected that operators will not voluntarily agree to serve the unprofitable markets, it may be necessary, depending upon the implementation technique selected, to solicit operators actively to initiate air service. Operator selection criteria should consider financial stability, experience and qualifications, proposed promotional programs, and proposed operating practices. (Appendix 5 elaborates upon these selection considerations.) Action agencies recommended to accomplish this activity include state aviation officials, the intrastate air service regulatory body, the communities involved, and any established responsible regional organizations.

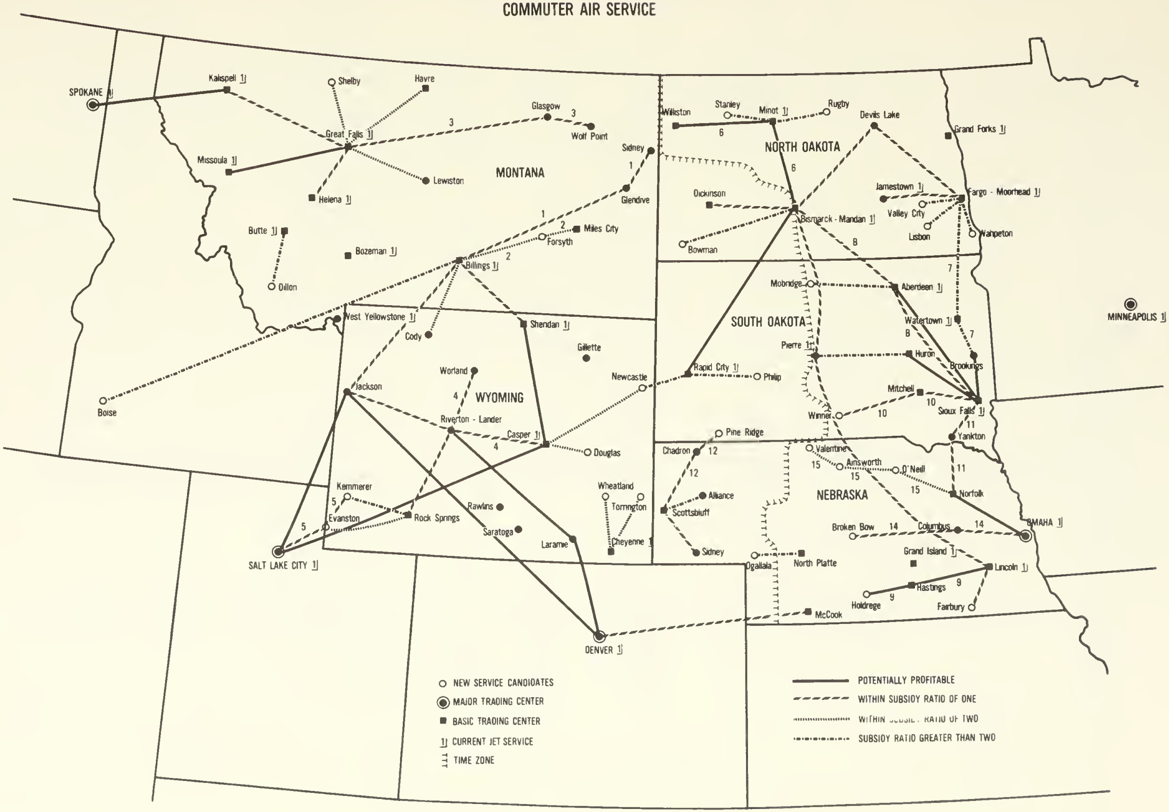
### (7) Monitor and Evaluate Service

Subsequent to the initiation of service operations and again depending upon the form of implementation and economic assistance, it will be necessary to monitor and evaluate continuously the service being provided. Further, as service conditions change because of new developments, unexpected demographic changes, or patronage varying from original estimates, it may be necessary to vary service characteristics to fit the particular situation. Such activities would be expected to continue at least until profitable operation levels have been achieved, and should be accomplished by the operators, the respective state air service regulatory agencies, and any responsible regional organization that may have been established.

- BASIC NETWORK CONCEPT (Map)
- NOMINAL DEMAND
- ROUTE ANALYSIS OUTPUT (Non-Stop Routes)
- ROUTE ANALYSIS OUTPUT (Multi-Stop Routes)

# Basic Network Concept

## COMMUTER AIR SERVICE



# NOMINAL DEMAND ANALYSIS FORMAT DESCRIPTION

The attached computer run identifies the city-pairs being analyzed in the noted air service concept and includes the following information:

- Type. The city-pair type, A, B, or C, is entered in this column (refer to Determination of Air Demand for definition of Type A, B, and C categories). Where an R or an S follows the type entry, it indicates either a recent internal revision or special consideration for analysis due to distance or population factors.

- Number. This entry is simply a city-pair number assigned for analysis convenience in the computer program.

- Distance. Air distance between city-pair in statue miles.

- Fare. Nominal air fare based on current air fares charged in the Old West Region ($15 plus 8.5 cents per mile).

- 1976 and 1985 Demand. These columns represent the two-way daily person trips by air forecasted for the noted time periods. They include local O&D as well as connecting passengers (both on-line and interline).

### OLD WEST BASIC NETWORK-NOMINAL FARE AND DEMAND

| CITY PAIR | | TYPE | NO. | DIST. | FARE | 76 DEMAND | 85 DEMAND |
|---|---|---|---|---|---|---|---|
| ABERDEEN | BISMARCK | AR | 68 | 148 | $28 | 9.8 | 9.0 |
| ABERDEEN | HURON | C | 48 | 68 | $21 | 4.3 | 4.3 |
| ABERDEEN | MINOT | AR | 69 | 198 | $32 | 2.3 | 2.5 |
| ABERDEEN | MOBRIDGE | C | 46 | 101 | $24 | 2.6 | 3.0 |
| ABERDEEN | SIOUX FAL | AR | 70 | 145 | $27 | 42.5 | 43.7 |
| AINSWORTH | NORFOLK | B | 27 | 136 | $27 | 2.2 | 2.4 |
| ALLIANCE | SCOTTSBLF | B | 17 | 37 | $18 | 2.3 | 2.3 |
| BILLINGS | BOISE | C | 14 | 454 | $54 | 4.5 | 5.3 |
| BILLINGS | CODY | A | 59 | 84 | $22 | 4.2 | 5.0 |
| BILLINGS | FORSYTH | C | 13 | 111 | $24 | 2.1 | 2.3 |
| BILLINGS | GLENDIVE | C | 11 | 209 | $33 | 9.4 | 10.3 |
| BILLINGS | JACKSON | A | 71 | 168 | $29 | 10.2 | 14.3 |
| BILLINGS | MILES CTY | A | 12 | 134 | $26 | 5.2 | 5.7 |
| BILLINGS | SHERIDAN | A | 60 | 101 | $24 | 7.4 | 9.1 |
| BILLINGS | SIDNEY | C | 10 | 265 | $38 | 8.3 | 9.4 |
| BISMARCK | BOWMAN | C | 35 | 144 | $27 | 3.6 | 3.4 |
| BISMARCK | DICKINSON | C | 34 | 100 | $24 | 4.9 | 4.3 |
| BISMARCK | DEVILS LK | C | 36 | 130 | $26 | 7.5 | 7.5 |
| BISMARCK | MINOT | A | 72 | 87 | $22 | 12.6 | 12.0 |
| BISMARCK | PIERRE | C | 44 | 266 | $38 | 8.6 | 8.6 |
| BISMARCK | RAPID CIT | A | 43 | 325 | $43 | 20.3 | 19.6 |
| BISMARCK | SIOUX FAL | A | 73 | 293 | $40 | 20.8 | 19.3 |
| BISMARCK | WILLISTON | C | 30 | 193 | $31 | 7.5 | 6.4 |
| BROKENBOW | OMAHA | B | 117 | 193 | $31 | 17.5 | 17.6 |
| BROOKINGS | FARGO | A | 74 | 150 | $28 | 2.7 | 3.1 |
| BROOKINGS | SIOUX FAL | A | 133 | 46 | $19 | 9.5 | 10.4 |
| BUTTE | DILLON | C | 90 | 48 | $19 | 1.1 | 1.1 |
| CASPER | DOUGLAS | B | 63 | 61 | $20 | 2.8 | 3.6 |
| CASPER | NEWCASTLE | B | 64 | 125 | $26 | 3.4 | 3.4 |
| CASPER | RIVERTON | A | 93 | 101 | $24 | 30.6 | 34.3 |
| CASPER | SALT LAKE | A | 61 | 256 | $37 | 70.9 | 78.5 |
| CASPER | SHERIDAN | A | 94 | 131 | $23 | 60.6 | 67.7 |
| CASPER | WORLAND | A | 95 | 122 | $25 | 17.4 | 18.7 |
| CHADRON | SCOTTSBLF | B | 15 | 68 | $21 | 6.2 | 6.6 |
| CHEYENNE | DENVER | AS | 75 | 108 | $24 | 45.9 | 61.0 |
| CHEYENNE | TORRINGTN | B | 67 | 69 | $21 | 2.8 | 3.4 |
| CHEYENNE | WHEATLAND | B | 66 | 58 | $20 | 2.4 | 3.0 |
| COLUMBUS | OMAHA | A | 76 | 81 | $22 | 4.6 | 5.2 |
| DENVER | JACKSON | A | 77 | 402 | $49 | 65.1 | 93.8 |
| DENVER | MCCOOK | A | 22 | 224 | $34 | 11.0 | 13.0 |
| DEVILS LK | FARGO | C | 38 | 164 | $29 | 12.4 | 15.2 |
| DEVILS LK | GRD FORKS | A | 37 | 80 | $22 | 9.8 | 11.8 |
| EVANSTON | ROCKSPRIN | B | 54 | 102 | $24 | 4.9 | 6.2 |
| EVANSTON | SALT LAKE | B | 53 | 65 | $20 | 16.0 | 17.5 |
| FAIRBURY | LINCOLN | B | 26 | 55 | $20 | 8.8 | 9.0 |
| FARGO | JAMESTOWN | C | 39 | 87 | $22 | 6.6 | 7.3 |

|  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|
| FARGO | LISBON | C | 40 | 46 | $19 | 1.9 | 1.9 |
| FARGO | VALLEY CI | C | 91 | 56 | $20 | 1.3 | 1.5 |
| FARGO | WAHPETON | C | 41 | 37 | $18 | 1.1 | 1.3 |
| FARGO | WATERTOWN | A | 78 | 118 | $25 | 1.6 | 2.0 |
| GLASGOW | GRT FALLS | C | 5 | 253 | $36 | 8.5 | 11.6 |
| GRAND IS. | MCCOOK | B | 21 | 132 | $26 | 5.6 | 5.8 |
| GRT FALLS | HAVRE | A | 04 | 107 | $24 | 3.9 | 4.5 |
| GRT FALLS | HELENA | A | 08 | 63 | $20 | 5.7 | 7.4 |
| GRT FALLS | KALISPELL | A | 02 | 139 | $27 | 12.1 | 14.6 |
| GRT FALLS | LEWISTOWN | A | 9 | 90 | $23 | 2.8 | 3.1 |
| GRT FALLS | MISSOULA | A | 7 | 131 | $26 | 39.5 | 47.1 |
| GRT FALLS | SHELBY | C | 3 | 89 | $22 | 4.1 | 4.1 |
| GRT FALLS | WOLF PT. | C | 6 | 302 | $41 | 6.6 | 7.1 |
| HASTINGS | LINCOLN | B | 25 | 92 | $23 | 21.0 | 22.7 |
| HOLDREGE | LINCOLN | B | 96 | 143 | $27 | 8.5 | 9.0 |
| HURON | PIERRE | C | 49 | 92 | $23 | 3.6 | 3.8 |
| HURON | SIOUX FAL | A | 81 | 79 | $22 | 20.6 | 20.9 |
| JACKSON | RIVERTON | B | 52 | 133 | $26 | 11.1 | 14.8 |
| JACKSON | SALT LAKE | A | 82 | 205 | $33 | 53.8 | 70.4 |
| KALISPELL | SPOKANE | A | 1 | 167 | $29 | 68.2 | 67.4 |
| KEMMERER | ROCK SPR | B | 55 | 80 | $22 | 2.4 | 3.2 |
| KEMMERER | SALT LAKE | B | 56 | 116 | $25 | 7.9 | 9.0 |
| LARAMIE | RIVERTON | A | 58 | 189 | $31 | 15.7 | 17.6 |
| LINCOLN | PIERRE | C | 29 | 351 | $45 | 12.0 | 14.3 |
| MINOT | RAPID CTY | A | 42 | 293 | $40 | 13.2 | 15.2 |
| MINOT | RUGBY | C | 33 | 63 | $20 | 2.2 | 2.4 |
| MINOT | STANLEY | C | 32 | 49 | $19 | 1.7 | 1.9 |
| MINOT | WILLISTON | A | 31 | 114 | $25 | 7.2 | 7.3 |
| MITCHELL | SIOUX FAL | A | 83 | 58 | $20 | 14.4 | 15.1 |
| MITCHELL | WINNER | C | 47 | 92 | $23 | 1.1 | 1.1 |
| NEWCASTLE | RAPID CTY | B | 65 | 75 | $21 | 3.2 | 3.4 |
| NORFOLK | SIOUX FAL | A | 86 | 120 | $25 | 6.8 | 7.8 |
| NORFOLK | OMAHA | A | 85 | 102 | $24 | 21.8 | 25.0 |
| NORFOLK | ONEILL | B | 28 | 70 | $21 | 3.6 | 4.3 |
| NORFOLK | VALENTINE | BS | 137 | 173 | $30 | 3.9 | 4.2 |
| N.PLATTE | OGALLALA | B | 19 | 53 | $20 | 2.4 | 2.6 |
| N.PLATTE | VALENTINE | B | 20 | 125 | $26 | 3.4 | 3.6 |
| PHILLIP | RAPID CTY | C | 45 | 68 | $21 | 1.5 | 1.7 |
| PINERIDGE | SCOTTSBLF | C | 92 | 99 | $23 | 4.5 | 5.4 |
| RIVERTON | ROCK SPR | B | 57 | 110 | $31 | 7.7 | 10.3 |
| RIVERTON | WORLAND | A | 87 | 68 | $21 | 0.1 | 0.1 |
| SCOTTSBLF | SIDNEY | B | 18 | 61 | $20 | 4.9 | 5.1 |
| SIOUX FAL | WATERTOWN | A | 88 | 78 | $22 | 10.7 | 11.1 |
| SIOUX FAL | WINNER | CS | 97 | 153 | $28 | 4.8 | 5.1 |
| SIOUX FAL | YANKTON | A | 89 | 48 | $19 | 12.8 | 13.4 |

## OLD WEST ROUTE ANALYSIS OUTPUT FORMAT DESCRIPTION

### ( NON-STOP ROUTES )

| Route Name | Route No. | Revenue (000) | Cost (000) | P/L $(000) | Loss Ratio | A/C Ratio | Freq. DRT | No. A/C | PLF | Pass/ Day | Fare |
|---|---|---|---|---|---|---|---|---|---|---|---|

Revenue = Annual route revenue in dollars

Cost = Route annual direct and indirect operating cost (including a 12. 35% average annual return on investment in dollars)

P/L = Annual route profit or loss

Loss Ratio = Loss (required subsidy) divided by revenue

A/C Cap = Aircraft passenger capacity

Freq (DRT) = Service frequency in daily round trips

No. A/C = Fraction of aircraft required on route at 2500 hours annual utilization

PLF = Passenger load factor (average of total route)

Pass/Day = Number of two way daily passengers between communites

Fare = One-way fare related to noted passenger demand

BASIC NETWORK WITH SEASONALITY SEPT 10,1975

| ROUTE (CITY-PAIR) | RT. NO. | DIST | REVENUE (000) | COST (000) | P/L (000) | LOSS RATIO | A/C CAP | FREQ DRT | NO. A/C | PLF | PASS/ DAY | FARE (OW) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ABERDEEN-MOBRIDGE | 136 | 101 | 21.1 | 93.6 | ¯72.5 | 3.44 | 5 | 2 | .34 | .13 | 2.6 | 24 |
| ABERDEEN-SIOUX FALLS | 137 | 145 | 682.1 | 543.1 | 139.0 |  | 15 | 4 | .77 | .54 | 65.1 | 31 |
| AINSWORTH-NORFOLK | 154 | 136 | 20.1 | 113.8 | ¯93.7 | 4.67 | 5 | 2 | .44 | .11 | 2.2 | 27 |
| ALLIANCE-SCOTTSBLF | 144 | 37 | 14.0 | 55.7 | ¯41.7 | 2.98 | 5 | 2 | .17 | .11 | 2.3 | 16 |
| BILLINGS-BOISE | 108 | 454 | 119.0 | 645.1 | ¯526.1 | 4.42 | 15 | 2 | 1.07 | .15 | 8.8 | 40 |
| BILLINGS-CODY | 110 | 84 | 42.6 | 97.5 | ¯54.9 | 1.29 | 8 | 2 | .31 | .22 | 7.0 | 18 |
| BILLINGS-JACKSON | 120 | 168 | 130.1 | 166.0 | ¯35.9 | .28 | 8 | 2 | .55 | .48 | 15.4 | 25 |
| BILLINGS-SHERIDAN | 111 | 101 | 81.1 | 114.6 | ¯33.5 | .41 | 8 | 2 | .35 | .38 | 12.0 | 20 |
| BISMARCK-BOWMAN | 131 | 144 | 32.9 | 120.0 | ¯87.2 | 2.65 | 5 | 2 | .46 | .18 | 3.6 | 27 |
| BISMARCK-DEVILS LAKE | 150 | 130 | 87.7 | 134.9 | ¯47.2 | .54 | 8 | 2 | .44 | .37 | 11.8 | 22 |
| BISMARCK-DICKENSON | 130 | 100 | 53.4 | 98.5 | ¯45.1 | .84 | 5 | 2 | .34 | .39 | 7.9 | 20 |
| BISMARCK-PIERRE | 142 | 266 | 134.9 | 233.3 | ¯98.4 | .73 | 8 | 2 | .62 | .42 | 13.3 | 30 |
| BISMARCK-RAPID CITY | 141 | 325 | 251.4 | 280.8 | ¯29.4 | .12 | 8 | 2 | .99 | .54 | 17.3 | 43 |
| BROOKINGS - SIOUX FALLS | 157 | 50 | 85.7 | 83.1 | 2.6 |  | 8 | 2 | .21 | .53 | 16.9 | 15 |
| BROKENBOW-GRAND IS. | 149 | 66 | 41.2 | 83.7 | ¯42.6 | 1.03 | 8 | 2 | .26 | .18 | 5.8 | 21 |
| BUTTE-DILLON | 107 | 48 | 10.1 | 62.8 | ¯52.7 | 5.19 | 5 | 2 | .20 | .15 | 3.0 | 10 |
| CASPER-DOUGLAS | 112 | 61 | 27.4 | 72.8 | ¯45.4 | 1.66 | 5 | 2 | .24 | .27 | 5.4 | 15 |
| CASPER-NEWCASTLE | 113 | 125 | 42.6 | 111.7 | ¯69.1 | 1.62 | 5 | 2 | .41 | .31 | 6.3 | 20 |
| CASPER-SALT LAKE CITY | 115 | 256 | 1735.4 | 1279.1 | 456.4 |  | 15 | 6 | 1.69 | .63 | 114.1 | 45 |
| CASPER-SHERIDAN | 119 | 131 | 958.2 | 766.6 | 191.6 |  | 15 | 6 | 1.07 | .58 | 105.0 | 27 |
| CHEYENNE-TORRINGTON | 117 | 69 | 28.7 | 77.4 | ¯48.8 | 1.70 | 5 | 2 | .26 | .26 | 5.3 | 16 |
| CHEYENNE-WHEATLAND | 118 | 58 | 24.3 | 70.4 | ¯46.1 | 1.89 | 5 | 2 | .23 | .24 | 4.8 | 15 |
| COLUMBUS-OMAHA | 147 | 81 | 50.7 | 98.4 | ¯47.7 | .94 | 8 | 2 | .30 | .31 | 10.0 | 15 |
| DENVER-JACKSON | 122 | 402 | 2305.1 | 2445.6 | ¯140.5 | .06 | 15 | 8 | 3.80 | .52 | 124.0 | 55 |
| DENVER-LARAMIE | 116 | 115 | 258.4 | 196.6 | 61.8 |  | 8 | 3 | .59 | .57 | 27.3 | 26 |
| DENVER-MCCOOK | 152 | 224 | 160.2 | 206.5 | ¯46.3 | .29 | 8 | 2 | .70 | .49 | 15.6 | 30 |
| DEVILS LAKE-FARGO | 155 | 164 | 150.3 | 165.0 | ¯14.8 | .10 | 8 | 2 | .53 | .53 | 17.1 | 26 |
| EVANSTON-ROCK SPRINGS | 125 | 102 | 39.7 | 96.6 | ¯56.8 | 1.43 | 5 | 2 | .35 | .24 | 4.9 | 24 |
| FARGO-JAMESTOWN | 133 | 87 | 65.9 | 102.7 | ¯36.7 | .55 | 8 | 2 | .32 | .34 | 11.0 | 18 |
| FARGO-LISBON | 132 | 48 | 12.2 | 60.6 | ¯48.4 | 3.95 | 5 | 2 | .19 | .09 | 1.9 | 19 |
| FARGO-VALLEY CITY | 134 | 56 | 8.8 | 65.9 | ¯57.1 | 6.50 | 5 | 2 | .22 | .06 | 1.3 | 20 |
| FARGO-WAHPETON | 135 | 37 | 6.7 | 54.5 | ¯47.8 | 7.15 | 5 | 2 | .17 | .06 | 1.1 | 18 |
| GREAT FALLS-HAVRE | 102 | 107 | 45.6 | 102.3 | ¯56.6 | 1.24 | 5 | 2 | .36 | .38 | 7.5 | 18 |
| GREAT FALLS-HELENA | 104 | 63 | 55.8 | 86.7 | ¯30.9 | .55 | 8 | 2 | .25 | .34 | 11.0 | 15 |
| GREAT FALLS-KALISPELL | 101 | 139 | 129.3 | 145.1 | ¯15.9 | .12 | 8 | 2 | .46 | .48 | 15.3 | 25 |
| GREAT FALLS-LEWISTOWN | 109 | 90 | 32.2 | 90.2 | ¯58.0 | 1.80 | 5 | 2 | .31 | .28 | 5.6 | 17 |
| GREAT FALLS-MISSOULA | 105 | 131 | 468.4 | 384.2 | 84.2 |  | 15 | 3 | .53 | .59 | 53.3 | 26 |
| GREAT FALLS-SHELBY | 103 | 89 | 43.1 | 91.5 | ¯48.4 | 1.12 | 5 | 2 | .31 | .38 | 7.5 | 17 |
| HURON-PIERRE | 145 | 92 | 28.0 | 89.3 | ¯61.4 | 2.19 | 5 | 2 | .32 | .18 | 3.6 | 23 |
| HURON-SIOUX FALLS | 146 | 79 | 153.2 | 107.5 | 45.6 |  | 8 | 2 | .29 | .64 | 20.6 | 22 |
| JACKSON-RIVERTON | 124 | 133 | 129.4 | 143.1 | ¯13.7 | .11 | 8 | 2 | .45 | .54 | 17.4 | 22 |
| JACKSON-SALT LAKE CITY | 121 | 205 | 1170.8 | 1041.1 | 129.7 |  | 15 | 6 | 1.56 | .48 | 86.6 | 40 |
| KALISPELL-SPOKANE | 106 | 167 | 1372.5 | 919.7 | 452.8 |  | 15 | 6 | 1.31 | .63 | 112.8 | 36 |
| KEMMERER-ROCK SPRINGS | 126 | 80 | 24.3 | 82.7 | ¯58.3 | 2.40 | 5 | 2 | .29 | .20 | 4.0 | 18 |
| LARAMIE-RIVERTON | 114 | 189 | 190.2 | 185.7 | 4.5 |  | 8 | 2 | .60 | .61 | 19.4 | 29 |
| LINCOLN-FAIRBURY | 148 | 55 | 59.5 | 78.9 | ¯19.4 | .33 | 8 | 2 | .22 | .27 | 8.8 | 20 |
| LINCOLN-PIERRE | 138 | 351 | 194.7 | 295.3 | ¯100.6 | .52 | 8 | 2 | 1.06 | .45 | 14.4 | 40 |
| MINOT-RUGBY | 129 | 63 | 14.9 | 70.9 | ¯56.0 | 3.76 | 5 | 2 | .24 | .11 | 2.2 | 20 |
| MINOT-STANLEY | 127 | 49 | 17.2 | 63.8 | ¯46.5 | 2.70 | 5 | 2 | .20 | .17 | 3.4 | 15 |
| NEWCASTLE-RAPID CITY | 140 | 75 | 15.6 | 77.9 | ¯62.3 | 3.99 | 5 | 2 | .27 | .11 | 2.2 | 21 |
| NORFOLK-OMAHA | 156 | 102 | 173.2 | 124.1 | 49.1 |  | 8 | 2 | .36 | .64 | 20.5 | 25 |
| NORFOLK-ONEILL | 153 | 70 | 25.6 | 76.3 | ¯50.8 | 1.99 | 5 | 2 | .26 | .18 | 3.6 | 21 |
| N. PLATTE-OGALLALA | 143 | 53 | 16.2 | 65.2 | ¯48.9 | 3.02 | 5 | 2 | .21 | .12 | 2.4 | 20 |
| N. PLATTE-VALENTINE | 139 | 125 | 29.9 | 108.6 | ¯78.7 | 2.64 | 5 | 2 | .41 | .17 | 3.4 | 26 |
| PHILLIP-RAPID CITY | 128 | 68 | 10.6 | 73.1 | ¯62.5 | 5.87 | 5 | 2 | .25 | .07 | 1.5 | 21 |
| RIVERTON-ROCK SPRINGS | 123 | 110 | 111.5 | 122.2 | ¯10.7 | .10 | 8 | 2 | .38 | .41 | 13.2 | 25 |
| SCOTTSBLF-SIDNEY | 151 | 61 | 40.8 | 74.0 | ¯33.3 | .82 | 5 | 2 | .24 | .33 | 6.7 | 18 |

## OLD WEST ROUTE ANALYSIS OUTPUT FORMAT DESCRIPTION

## (MULTI-STOP ROUTES)

The multi-stop computer outputs are designed to provide visibility into the key characteristics of each route segment. It includes an origin and destination section identifying the city-pairs involved in the route, the two-way daily air passengers between each city-pair, the airway distance in statute miles for each segment, and a one-way fare in dollars. In some cases, a community is involved in more than one route (e. g. Norfolk, Nebraska, to Omaha). The total demand from Norfolk to Omaha is thus the sum of the non-stop route demand plus the Norfolk-Omaha segment demand of the multi-stop route.

The segment data section describes each flight segment in terms of on-board passengers and each segment's load factor.

The route data section summarizes, on a route basis, the annual revenue, direct and indirect operating costs, and resultant profit or loss. It also includes the number of hours per day the aircraft is operating (block time), the number of daily round trips, the recommended aircraft size, the number of aircraft required for the route based upon a desired 2500 hours yearly utilization, the average route load factor, and, where routes are unprofitable, a subsidy or loss ratio (loss or required subsidy divided by the revenue).

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                                              BASIC NETWORK WITH SEASONALITY SEPT 9,1975


                      ROUTE 1: BILLINGS-GLENDIVE-SIDNEY


              ORIGIN AND DESTINATION                                  ROUTE DATA


                              2-WAY    DISTANCE   ONE-WAY    ANNUAL
         CITY PAIR         DAILY PASS.  (S. MI.)   FARE
                               (1)        (2)                  REVENUE (000)         208.7

    BILLINGS-GLENDIVE         12.6        209      30.00       OPER. COST(000)       267.7

    GLENDIVE-SIDNEY             .0         51        .00       PROFIT/LOSS(000)      ¯59.1

    BILLINGS-SIDNEY            6.3                 38.00     BLOCK_TIME(DAILY HR)      6.0

                                                             FREQUENCY(DPT)              2
                     SEGMENT DATA
                                                             AIRCRAFT_SIZE               8

          SEGMENT              ON-BOARD PASS.   LOAD FACTOR  NO_OF_AIRCRAFT(3)         .67

                                                             AVG_LOAD_FACTOR           .51
    BILLINGS-GLENDIVE              18.9            .59
                                                             LOSS_RATIO               .283
    GLENDIVE-SIDNEY                 6.3            .20


      (1) ON THIS ROUTE
      (2) AIRWAY DISTANCE
      (3) BASED ON 2500 HR YEARLY
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                                                       BASIC NETWORK WITH SEASONALITY SEPT 9,1975

                         ROUTE 2: BILLINGS-FORSYTH-MILES CITY


                    ORIGIN AND DESTINATION                               ROUTE DATA


                              2-WAY    DISTANCE   ONE-WAY    ANNUAL
          CITY PAIR        DAILY PASS.  (S. MI.)    FARE
                               (1)        (2)                  REVENUE (000)          62.9

  BILLINGS-FORSYTH             3.4        111      20.00       OPER. COST(000)       159.2

  FORSYTH-MILES CITY            .0         35        .00       PROFIT/LOSS(000)      ¯96.3

  BILLINGS-MILES CITY          5.9                 20.00     BLOCK_TIME(DAILY HR)    3.7

                                                             FREQUENCY(DAY)            2
                       SEGMENT DATA
                                                             AIRCRAFT_SIZE             5

         SEGMENT            ON-BOARD PASS.   LOAD FACTOR     NO_OF_AIRCRAFT(3)       .54

                                                             AVG_LOAD_FACTOR         .42
  BILLINGS-FORSYTH               9.3            .46
                                                             LOSS_RATIO            1.532
  FORSYTH-MILES CITY             5.9            .29


   (1) ON THIS ROUTE
   (2) AIRWAY DISTANCE
   (3) BASED ON 2500 HR YEARLY
```

## ROUTE 3: GREAT FALLS-GLASGOW-WOLF PT.

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| GREAT FALLS-GLASGOW | 10.0 | 253 | 33.00 |
| GLASGOW-WOLF PT. | .0 | 49 | .00 |
| GREAT FALLS-WOLF PT. | 6.9 | | 35.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| GREAT FALLS-GLASGOW | 16.9 | .53 |
| GLASGOW-WOLF PT. | 6.9 | .22 |

### ROUTE DATA

| | |
|---|---|
| ANNUAL | |
| REVENUE (000) | 193.2 |
| OPER. COST(000) | 295.5 |
| PROFIT/LOSS(000) | ¯102.4 |
| BLOCK_TIME(DAILY HR) | 6.8 |
| FREQUENCY(DAY) | 2 |
| AIRCRAFT_SIZE | 8 |
| NO_OF_AIRCRAFT(3) | .99 |
| AVG_LOAD_FACTOR | .48 |
| LOSS_RATIO | .530 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 4: CASPER-RIVERTON-WORLAND

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| CASPER-RIVERTON | 28.5 | 101 | 30.00 |
| RIVERTON-WORLAND | .2 | 68 | 21.00 |
| CASPER-WORLAND | 23.5 | | 25.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| CASPER-RIVERTON | 52.0 | .58 |
| RIVERTON-WORLAND | 23.7 | .26 |

### ROUTE DATA

| | |
|---|---|
| ANNUAL | |
| REVENUE (000) | 489.0 |
| OPER. COST(000) | 531.2 |
| PROFIT/LOSS(000) | -42.2 |
| BLOCK_TIME(DAILY HR) | 5.2 |
| FREQUENCY(DAY) | 3 |
| AIRCRAFT_SIZE | 15 |
| NO_OF_AIRCRAFT(3) | .76 |
| AVG_LOAD_FACTOR | .45 |
| LOSS_RATIO | .086 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

```
                                                    BASIC NETWORK WITH SEASONALITY SEPT 9,1975

                            ROUTE 5: KEMMERER-EVASTON-SALT LAKE CITY


                       ORIGIN AND DESTINATION                                   ROUTE DATA

                                   2-WAY    DISTANCE   ONE-WAY     ANNUAL
            CITY PAIR          DAILY PASS.  (S. MI.)    FARE
                                   (1)        (2)                    REVENUE (000)        151.3

    KEMMERER-EVASTON                .0         55        .00         OPER. COST(000)      195.6

    EVASTON-SALT LAKE CITY         16.0       102       20.00        PROFIT/LOSS(000)     -44.4

    KEMMERER-SALT LAKE CITY         5.1                 25.00      BLOCK_TIME(DAILY HR)     4.0

                                                                   FREQUENCY(DRT)             2
                          SEGMENT DATA
                                                                   AIRCRAFT_SIZE              8

              SEGMENT            ON-BOARD PASS.   LOAD FACTOR      NO_OF_AIRCRAFT(3)        .58

                                                                   AVG_LOAD_FACTOR          .48
    KEMMERER-EVASTON                  5.1             .16
                                                                   LOSS_RATIO              .293
    EVASTON-SALT LAKE CITY           21.1             .66


       (1) ON THIS ROUTE
       (2) AIRWAY DISTANCE
       (3) BASED ON 2500 HR YEARLY
```

## ROUTE 6: BISMARCK-MINOT-WILLISTON

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| BISMARCK-MINOT | 8.8 | 87 | 28.00 |
| MINOT-WILLISTON | 7.2 | 114 | 25.00 |
| BISMARCK-WILLISTON | 8.1 | | 28.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| BISMARCK-MINOT | 16.9 | .53 |
| MINOT-WILLISTON | 15.3 | .48 |

### ROUTE DATA

| | |
|---|---|
| ANNUAL | |
| REVENUE (000) | 220.8 |
| OPER. COST(000) | 229.8 |
| PROFIT/LOSS(000) | -9.1 |
| BLOCK TIME(DAILY HR) | 4.8 |
| FREQUENCY(DAY) | 2 |
| AIRCRAFT SIZE | 8 |
| NO OF AIRCRAFT(3) | .71 |
| AVG LOAD FACTOR | .50 |
| LOSS RATIO | .041 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

```
                                                            BASIC NETWORK WITH SEASONALITY SEPT 9,1975


                                 ROUTE 7: BROOKINGS-WATERTOWN-FARGO


                  ORIGIN AND DESTINATION                                          ROUTE DATA


                                      2-WAY    DISTANCE   ONE-WAY      ANNUAL
            CITY PAIR              DAILY PASS.  (S. MI.)    FARE
                                       (1)        (2)                    REVENUE (000)          39.9

   BROOKINGS-WATERTOWN                  .0         57         .00        OPER. COST(000)       172.2

   WATERTOWN-FARGO                     2.8        118       20.00        PROFIT/LOSS(000)     -132.2

   BROOKINGS-FARGO                     2.7                  23.00      BLOCK_TIME(DAILY HR)      4.2

                                                                       FREQUENCY(DAY)              2
                            SEGMENT DATA
                                                                       AIRCRAFT_SIZE               5

             SEGMENT                ON-BOARD PASS.   LOAD FACTOR       NO_OF_AIRCRAFT(3)         .62

                                                                       AVG_LOAD_FACTOR           .23
   BROOKINGS-WATERTOWN                    2.7            .13
                                                                       LOSS_RATIO              3.313
   WATERTOWN-FARGO                        5.5            .27


     (1) ON THIS ROUTE
     (2) AIRWAY DISTANCE
     (3) BASED ON 2500 HR YEARLY
```

## ROUTE 8: BISMARCK-ABERDEEN-SIOUX FALLS

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| BISMARCK-ABERDEEN | 11.4 | 148 | 28.00 |
| ABERDEEN-SIOUX FALLS | 14.0 | 145 | 31.00 |
| BISMARCK-SIOUX FALLS | 22.1 | | 37.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| BISMARCK-ABERDEEN | 33.5 | .56 |
| ABERDEEN-SIOUX FALLS | 36.1 | .60 |

### ROUTE DATA

| ANNUAL | |
|---|---|
| REVENUE (000) | 530.9 |
| OPER. COST(000) | 532.8 |
| PROFIT/LOSS(000) | -1.9 |
| BLOCK_TIME(DAILY HR) | 5.3 |
| FREQUENCY(DRT) | 2 |
| AIRCRAFT_SIZE | 15 |
| NO_OF_AIRCRAFT(3) | .78 |
| AVG_LOAD_FACTOR | .58 |
| LOSS_RATIO | .004 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

```
                                              BASIC NETWORK WITH SEASONALITY SEPT 9,1975


                    ROUTE 9: HOLDREGE-HASTINGS-LINCOLN


               ORIGIN AND DESTINATION                                   ROUTE DATA

                                  2-WAY    DISTANCE   ONE-WAY    ANNUAL
          CITY PAIR             DAILY PASS. (S. MI.)    FARE
                                   (1)        (2)                  REVENUE (000)        273.5

    HOLDREGE-HASTINGS               .0         51        .00       OPER. COST(000)      276.0

    HASTINGS-LINCOLN              20.7         92      28.00       PROFIT/LOSS(000)     -2.5

    HOLDREGE-LINCOLN               8.5                 27.00     BLOCK_TIME(DAILY HR)    5.6

                                                                 FREQUENCY(DAY)            3
                       SEGMENT DATA
                                                                 AIRCRAFT_SIZE             8

           SEGMENT             ON-BOARD PASS.   LOAD FACTOR      NO_OF_AIRCRAFT(3)       .81

                                                                 AVG_LOAD_FACTOR         .45
    HOLDREGE-HASTINGS                8.5            .18
                                                                 LOSS_RATIO             .009
    HASTINGS-LINCOLN                29.2            .61


      (1) ON THIS ROUTE
      (2) AIRWAY DISTANCE
      (3) BASED ON 2500 HR YEARLY
```

## ROUTE 10: SIOUX FALLS-MITCHELL-WINNER

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| SIOUX FALLS-MITCHELL | 12.4 | 58 | 22.00 |
| MITCHELL-WINNER | 1.1 | 92 | 23.00 |
| SIOUX FALLS-WINNER | 2.9 | | 28.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| SIOUX FALLS-MITCHELL | 15.3 | .48 |
| MITCHELL-WINNER | 4.0 | .13 |

### ROUTE DATA

| ANNUAL | |
|---|---|
| REVENUE (000) | 128.2 |
| OPER. COST(000) | 184.8 |
| PROFIT/LOSS(000) | -56.6 |
| BLOCK_TIME(DAILY HR) | 3.9 |
| FRECUENCY(DRT) | 2 |
| AIRCRAFT_SIZE | 8 |
| NO_OF_AIRCRAFT(3) | .56 |
| AVG_LOAD_FACTOR | .26 |
| LOSS_RATIO | .442 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 11: NORFOLK-YANKTON-SIOUX FALLS

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| NORFOLK-YANKTON | .0 | 64 | .00 |
| YANKTON-SIOUX FALLS | 12.8 | 48 | 19.00 |
| NORFOLK-SIOUX FALLS | 5.9 | | 22.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| NORFOLK-YANKTON | 5.9 | .18 |
| YANKTON-SIOUX FALLS | 18.7 | .58 |

### ROUTE DATA

| ANNUAL | |
|---|---|
| REVENUE (000) | 126.1 |
| OPER. COST(000) | 160.6 |
| PROFIT/LOSS(000) | -34.6 |
| BLOCK_TIME(DAILY HR) | 3.1 |
| FREQUENCY(DAY) | 2 |
| AIRCRAFT_SIZE | 8 |
| NO_OF_AIRCRAFT(3) | .45 |
| AVG_LOAD_FACTOR | .36 |
| LOSS_RATIO | .274 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

```
                                                    BASIC NETWORK WITH SEASONALITY SEPT 9,1975


                              ROUTE 12: PINE RIDGE-CHADRON-SCOTTSBLUFF


                          ORIGIN AND DESTINATION                          ROUTE DATA

                                   2-WAY     DISTANCE   ONE-WAY    ANNUAL
              CITY PAIR         DAILY PASS.  (S. MI.)    FARE
                                    (1)        (2)                   REVENUE (000)          67.5

      PINE RIDGE-CHADRON             .0         31        .00        OPER. COST(000)       130.7

      CHADRON-SCOTTSBLUFF           6.2         68      21.00        PROFIT/LOSS(000)      -63.2

      PINE RIDGE-SCOTTSBLUFF        2.9                 24.00      BLOCK_TIME(DAILY HR)      2.8

                                                                   FREQUENCY(DPT)            2
                            SEGMENT DATA
                                                                   AIRCRAFT_SIZE             5

              SEGMENT              ON-BOARD PASS.   LOAD FACTOR    NO_OF_AIRCRAFT(3)       .41

                                                                   AVG_LOAD_FACTOR         .36
      PINE RIDGE-CHADRON                2.9             .14
                                                                   LOSS_RATIO             .935
      CHADRON-SCOTTSBLUFF               9.1             .45


        (1) ON THIS ROUTE
        (2) AIRWAY DISTANCE
        (3) BASED ON 2500 HR YEARLY
```

## ROUTE 13: BISMARCK-DICKINSON-BOWMAN

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| BISMARCK-DICKINSON | .0 | 51 | .00 |
| DICKINSON-BOWMAN | 4.9 | 100 | 24.00 |
| BISMARCK-BOWMAN | 2.2 | | 27.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| BISMARCK-DICKINSON | 2.2 | .11 |
| DICKINSON-BOWMAN | 7.1 | .35 |

### ROUTE DATA

| ANNUAL | |
|---|---|
| REVENUE (000) | 59.8 |
| OPER. COST(000) | 159.6 |
| PROFIT/LOSS(000) | -99.7 |
| BLOCK_TIME(DAILY HR) | 3.8 |
| FREQUENCY(DAY) | 2 |
| AIRCRAFT_SIZE | 5 |
| NO_OF_AIRCRAFT(3) | .55 |
| AVG_LOAD_FACTOR | .27 |
| LOSS_RATIO | 1.667 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 14: BROKEN BOW-COLUMBUS-OMAHA

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| BROKEN BOW-COLUMBUS | .0 | 112 | .00 |
| COLUMBUS-OMAHA | 6.3 | 81 | 20.00 |
| BROKEN BOW-OMAHA | 10.0 | | 35.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| BROKEN BOW-COLUMBUS | 10.0 | .31 |
| COLUMBUS-OMAHA | 16.3 | .51 |

### ROUTE DATA

| ANNUAL | |
|---|---|
| REVENUE (000) | 160.9 |
| OPER. COST(000) | 216.3 |
| PROFIT/LOSS(000) | -55.4 |
| BLOCK_TIME(DAILY HR) | 4.7 |
| FREQUENCY(DRT) | 2 |
| AIRCRAFT_SIZE | 8 |
| NO_OF_AIRCRAFT(3) | .68 |
| AVG_LOAD_FACTOR | .40 |
| LOSS_RATIO | .345 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 15: NORFOLK-O'NEILL-AINSWORTH-VALENTINE

Origin & Destination

| City Pair | 2-Way Daily Pass.[1] | Distance (S. Mi.)[2] | One-Way Fare |
|---|---|---|---|
| Norfolk-O'Neill | 7.1 | 70 | 16 |
| O'Neill-Ainsworth | 0 | 67 | - |
| Ainsworth-Valentine | 0 | 37 | - |
| Ainsworth-Norfolk | 3.0 | - | 21 |
| O'Neill-Valentine | 0 | - | - |
| Norfolk-Valentine | 3.9 | - | 23 |

Route Data

| Annual | |
|---|---|
| Revenue (000) | 90.0 |
| Oper. Cost (000) | 232.5 |
| Profit/Loss (000) | -142.5 |
| Block Time (Daily Hr) | 4.79 |
| Frequency (DRT) | 2 |
| Aircraft Size | 8 |
| No. of Aircraft[3] | .70 |
| Ave. Load Factor | 29% |
| Loss Ratio | 1.58 |

Segment Data

| Segment | On-Board Pass. | Load Factor |
|---|---|---|
| Norfolk-O'Neill | 14.0 | 44% |
| O'Neill-Ainsworth | 6.9 | 22% |
| Ainsworth-Valentine | 3.9 | 12% |

[1] On This Route

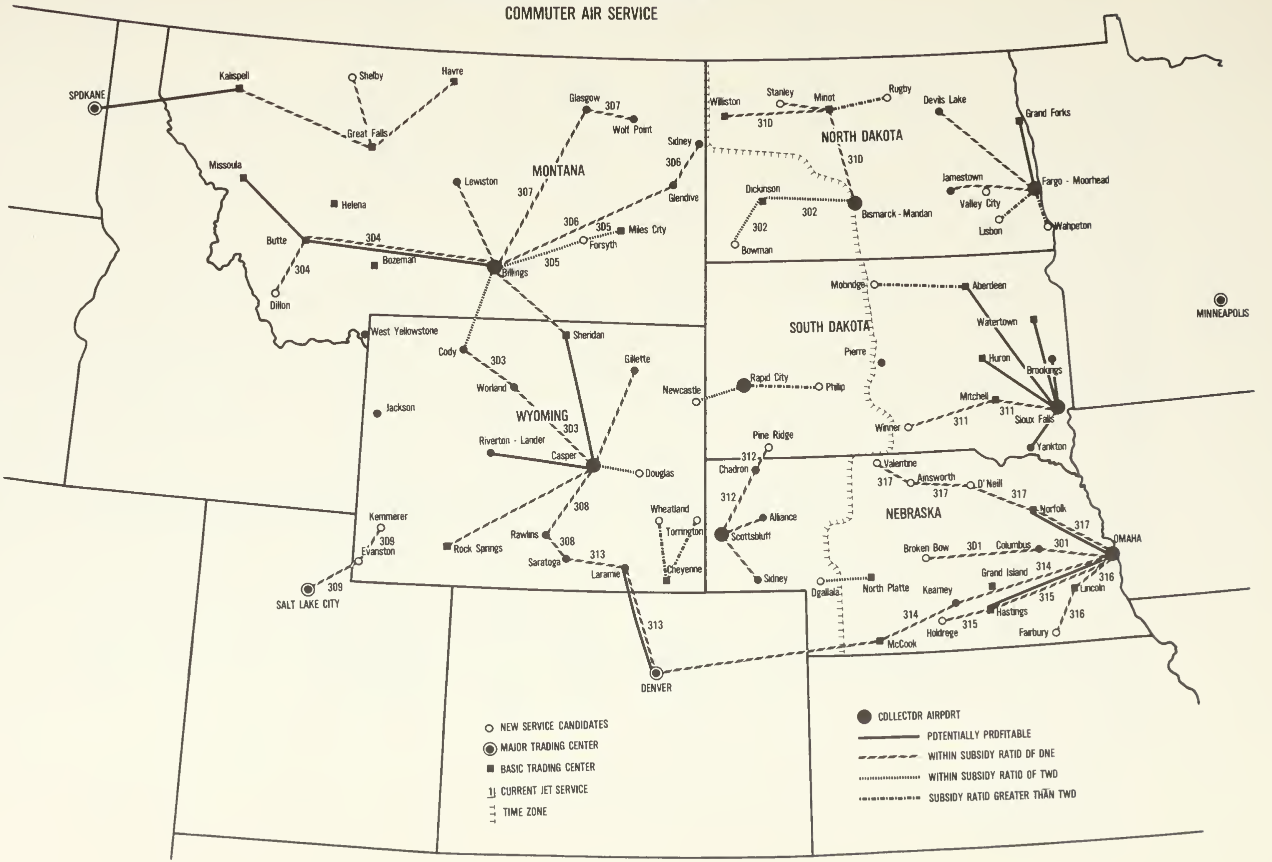
[2] Airway Distance

[3] Based on 2500 Hours Yearly

- SUBREGIONAL COLLECTOR CONCEPT (Map)
- NOMINAL DEMAND
- ROUTE ANALYSIS OUTPUT (Non-Stop Routes)
- ROUTE ANALYSIS OUTPUT (Multi-Stop Routes)

# Subregional Collector Concept

## COMMUTER AIR SERVICE



## NOMINAL DEMAND ANALYSIS FORMAT DESCRIPTION

The attached computer run identifies the city-pairs being analyzed in the noted air service concept and includes the following information:

- Type. The city-pair type, A, B, or C, is entered in this column (refer to Determination of Air Demand for definition of Type A, B, and C categories). Where an R or an S follows the type entry, it indicates either a recent internal revision or special consideration for analysis due to distance or population factors.

- Number. This entry is simply a city-pair number assigned for analysis convenience in the computer program.

- Distance. Air distance between city-pair in statue miles.

- Fare. Nominal air fare based on current air fares charged in the Old West Region ($15 plus 8.5 cents per mile).

- 1976 and 1985 Demand. These columns represent the two-way daily person trips by air forecasted for the noted time periods. They include local O&D as well as connecting passengers (both on-line and interline).

OLD WEST NETWORK NOMINAL DEMAND

| CITY | PAIR | TYPE | NO. | DIST. | FARE | 76DEMAND | 85DEMAND |
|---|---|---|---|---|---|---|---|
| ABERDEEN | MOBRIDGE | C | 40 | 101 | $24 | 3.2 | 3.7 |
| ABERDEEN | SIOUX FAL | AR | 70 | 145 | $27 | 42.5 | 43.7 |
| AINSWORTH | OMAHA | B | 116 | 245 | $36 | 8.3 | 8.7 |
| AINSWORTH | NORFOLK | CS | 27 | 130 | $27 | 1.2 | 1.3 |
| ALLIANCE | SCOTTSBLF | A | 17 | 57 | $18 | 6.3 | 6.5 |
| BILLINGS | BUTTE | A | 99 | 191 | $31 | 39.6 | 47.6 |
| BILLINGS | CODY | A | 59 | 84 | $22 | 3.9 | 4.0 |
| BILLINGS | DILLON | C | 123 | 190 | $32 | 8.7 | 9.0 |
| BILLINGS | FORSYTH | C | 13 | 111 | $24 | 2.5 | 3.2 |
| BILLINGS | GLASGOW | C | 127 | 188 | $31 | 10.8 | 15.6 |
| BILLINGS | GLENDIVE | C | 11 | 209 | $33 | 11.5 | 12.6 |
| BILLINGS | LEWISTON | A | 102 | 101 | $24 | 4.6 | 5.3 |
| BILLINGS | MILES CITY | A | 12 | 134 | $20 | 5.2 | 5.7 |
| BILLINGS | SHERIDAN | A | 60 | 101 | $24 | 7.4 | 9.1 |
| BILLINGS | SIDNEY | A | 10 | 265 | $38 | 8.3 | 9.4 |
| BILLINGS | WOLF PT. | C | 128 | 249 | $36 | 9.0 | 10.2 |
| BISMARCK | BOWMAN | C | 35 | 144 | $27 | 4.4 | 4.1 |
| BISMARCK | DICKINSON | C | 34 | 100 | $24 | 6.0 | 5.3 |
| BISMARCK | MINOT | A | 72 | 87 | $22 | 12.6 | 12.0 |
| BISMARCK | RUGBY | C | 131 | 104 | $29 | 1.5 | 1.4 |
| BISMARCK | STANLEY | C | 132 | 162 | $29 | 2.1 | 2.1 |
| BISMARCK | WILLISTON | C | 36 | 193 | $31 | 9.2 | 7.8 |
| BROKENBOW | OMAHA | B | 117 | 193 | $31 | 21.4 | 21.6 |
| BROOKING | SIOUX FAL | A | 133 | 46 | $19 | 9.6 | 10.4 |
| BUTTE | DILLON | C | 90 | 46 | $19 | 1.1 | 1.1 |
| BUTTE | MISSOULA | CS | 125 | 107 | $24 | 53.7 | 61.7 |
| CASPER | CODY | A | 110 | 201 | $32 | 21.6 | 23.6 |
| CASPER | DOUGLAS | B | 63 | 51 | $20 | 3.5 | 4.4 |
| CASPER | GILLETTE | B | 112 | 193 | $24 | 9.4 | 10.3 |
| CASPER | RAWLINS | B | 113 | 97 | $25 | 12.2 | 14.9 |
| CASPER | RIVERTON | A | 93 | 101 | $24 | 42.6 | 47.7 |
| CASPER | ROCK SPR | A | 114 | 160 | $29 | 5.4 | 6.9 |
| CASPER | SARATOGA | B | 115 | 113 | $25 | 3.2 | 3.7 |
| CASPER | SHERIDAN | A | 94 | 131 | $23 | 60.6 | 67.7 |
| CASPER | WORLAND | A | 95 | 122 | $25 | 17.4 | 18.7 |
| CHADRON | SCOTTSBLF | A | 15 | 47 | $19 | 12.0 | 12.7 |
| CHEYENNE | TORRINGTN | B | 67 | 69 | $21 | 3.5 | 4.1 |
| CHEYENNE | WHEATLAND | B | 66 | 58 | $20 | 3.0 | 3.7 |
| COLUMBUS | OMAHA | A | 76 | 81 | $22 | 4.6 | 5.2 |
| DENVER | LARAMIE | A | 104 | 113 | $25 | 24.3 | 29.6 |
| DENVER | MCCOOK | A | 22 | 224 | $34 | 11.0 | 13.0 |
| DENVER | SARATOGA | CS | 136 | 165 | $29 | 1.7 | 2.1 |
| DEVILS LK | FARGO | C | 36 | 164 | $29 | 15.2 | 18.6 |
| EVANSTON | SALT LAKE | B | 53 | 65 | $20 | 15.9 | 17.5 |

|  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|
| FAIRBURY | LINCOLN | BS | 26 | 35 | $20 | 4.7 | 4.8 |
| FAIRBURY | OMAHA | B | 116 | 162 | $24 | 18.9 | 18.9 |
| FARGO | GRD FORKS | A | 105 | 75 | $21 | 21.4 | 25.8 |
| FARGO | JAMESTOWN | C | 39 | 87 | $22 | 8.1 | 9.0 |
| FARGO | LISBON | C | 40 | 40 | $19 | 2.3 | 2.3 |
| FARGO | WAHPETON | C | 41 | 124 | $26 | 1.4 | 1.6 |
| GRT FALLS | HAVRE | A | 4 | 107 | $24 | 3.9 | 4.5 |
| GRT FALLS | KALISPELL | A | 2 | 139 | $27 | 12.1 | 14.0 |
| GRT FALLS | SHELBY | C | 3 | 69 | $22 | 5.1 | 5.1 |
| HASTINGS | OMAHA | A | 106 | 141 | $27 | 24.1 | 25.5 |
| HOLDREGE | OMAHA | B | 119 | 199 | $32 | 16.3 | 17.9 |
| HURON | PIERRE | C | 49 | 92 | $23 | 4.3 | 4.6 |
| HURON | SIOUX FAL | A | 81 | 79 | $22 | 20.6 | 20.9 |
| KALISPELL | SPOKANE | A | 1 | 167 | $29 | 68.2 | 67.4 |
| KEARNEY | DENVER | A | 108 | 310 | $42 | 17.4 | 22.0 |
| KEARNEY | OMAHA | A | 107 | 167 | $29 | 13.6 | 15.1 |
| KEMMERER | SALT LAKE | B | 36 | 110 | $25 | 9.7 | 11.0 |
| MCCOOK | OMAHA | A | 109 | 232 | $35 | 7.4 | 7.7 |
| MINOT | RUGBY | C | 33 | 63 | $20 | 2.8 | 3.0 |
| MINOT | STANLEY | C | 32 | 49 | $19 | 4.8 | 4.8 |
| MINOT | WILLISTON | A | 31 | 114 | $25 | 7.2 | 7.3 |
| MITCHELL | SIOUX FAL | A | 23 | 58 | $20 | 14.4 | 15.1 |
| MITCHELL | WINNER | C | 47 | 92 | $23 | 2.3 | 2.3 |
| NEWCASTLE | RAPID CIT | B | 65 | 75 | $21 | 4.1 | 4.4 |
| NORFOLK | OMAHA | A | 83 | 152 | $24 | 21.8 | 25.0 |
| NORFOLK | ONEILL | B | 28 | 70 | $21 | 2.0 | 2.4 |
| N.PLATTE | OGALLALA | B | 19 | 53 | $20 | 9.0 | 9.7 |
| N.PLATTE | VALENTINE | B | 20 | 125 | $26 | 4.1 | 4.4 |
| OMAHA | ONEILL | B | 121 | 178 | $30 | 16.3 | 17.9 |
| OMAHA | VALENTINE | B | 122 | 270 | $36 | 9.0 | 9.7 |
| PHILIP | RAPID CIT | C | 45 | 66 | $21 | 1.8 | 2.1 |
| PINERIDGE | SCOTTSBLF | CS | 92 | 99 | $23 | 10.5 | 11.0 |
| SCOTTSBLF | SIDNEY | BS | 16 | 61 | $20 | 10.7 | 10.8 |
| SIOUX FAL | WATERTOWN | A | 68 | 78 | $22 | 10.7 | 11.1 |
| SIOUX FAL | WINNER | C | 97 | 155 | $26 | 11.0 | 11.7 |
| SIOUX FAL | YANKTON | A | 69 | 46 | $19 | 12.6 | 13.4 |

# OLD WEST ROUTE ANALYSIS OUTPUT FORMAT DESCRIPTION

## ( NON-STOP ROUTES )

| Route Name | Route No. | Revenue (000) | Cost (000) | P/L $(000) | Loss Ratio | A/C Ratio | Freq. DRT | No. A/C | PLF | Pass/ Day | Fare |
|---|---|---|---|---|---|---|---|---|---|---|---|

Revenue = Annual route revenue in dollars

Cost = Route annual direct and indirect operating cost (including a 12. 35% average annual return on investment in dollars)

P/L = Annual route profit or loss

Loss Ratio = Loss (required subsidy) divided by revenue

A/C Cap = Aircraft passenger capacity

Freq (DRT) = Service frequency in daily round trips

No. A/C = Fraction of aircraft required on route at 2500 hours annual utilization

PLF = Passenger load factor (average of total route)

Pass/Day = Number of two way daily passengers between communites

Fare = One-way fare related to noted passenger demand

NETWORK-WITH SEASONALITY SEPT.9,1975

| ROUTE (CITY-PAIR) | RT. NO. | DIST | REVENUE (000) | COST (000) | P/L (000) | LOSS RATIO | A/C CAP | FREQ DRT | NO. A/C | PLF | PASS/ DAY | FARE (OW) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ABERDEEN-MOBRIDGE | 227 | 101 | 26.0 | 94.2 | -68.3 | 2.63 | 5 | 2 | .34 | .16 | 3.2 | 24 |
| ABERDEEN-SIOUX FALLS | 228 | 145 | 490.8 | 406.8 | 83.9 |  | 15 | 3 | .58 | .54 | 48.4 | 30 |
| ALLIANCE-SCOTTSBLUFF | 234 | 37 | 38.3 | 59.4 | -21.0 | .55 | 5 | 2 | .17 | .31 | 6.3 | 16 |
| BILLINGS-BUTTE | 212 | 126 | 622.2 | 373.4 | 248.8 |  | 15 | 3 | .52 | .58 | 52.6 | 35 |
| BILLINGS-CODY | 204 | 84 | 42.6 | 88.0 | -45.4 | 1.07 | 5 | 2 | .30 | .35 | 7.0 | 18 |
| BILLINGS-LEWISTOWN | 215 | 101 | 50.0 | 98.6 | -48.5 | .97 | 5 | 2 | .34 | .37 | 7.4 | 20 |
| BILLINGS-SHERIDAN | 213 | 101 | 81.1 | 114.6 | -33.5 | .41 | 8 | 2 | .35 | .38 | 12.0 | 20 |
| BROOKINGS-SIOUX FALLS | 206 | 50 | 85.7 | 83.1 | 2.6 |  | 8 | 2 | .21 | .53 | 16.9 | 15 |
| BUTTE-MISSOULA | 214 | 107 | 435.6 | 336.5 | 99.1 |  | 15 | 3 | .45 | .60 | 53.7 | 24 |
| CASPER-DOUGLAS | 216 | 61 | 36.2 | 74.0 | -37.8 | 1.04 | 5 | 2 | .24 | .33 | 6.7 | 16 |
| CASPER-GILLETTE | 217 | 103 | 76.3 | 101.8 | -25.6 | .34 | 5 | 2 | .35 | .47 | 9.4 | 24 |
| CASPER-RIVERTON | 210 | 101 | 446.4 | 321.5 | 125.0 |  | 15 | 3 | .44 | .56 | 50.8 | 26 |
| CASPER-ROCK SPRINGS | 219 | 160 | 69.3 | 134.7 | -65.4 | .94 | 5 | 2 | .51 | .41 | 6.2 | 25 |
| CASPER-SHERIDAN | 205 | 131 | 958.2 | 766.6 | 191.6 |  | 15 | 6 | 1.07 | .56 | 105.0 | 27 |
| CHADRON-SCOTTSBLUFF | 220 | 68 | 78.4 | 83.0 | -4.6 | .06 | 5 | 2 | .25 | .58 | 11.6 | 20 |
| CHEYENNE-TORRINGTON | 207 | 69 | 34.6 | 78.5 | -43.9 | 1.27 | 5 | 2 | .26 | .32 | 6.4 | 16 |
| CHEYENNE-WHEATLAND | 208 | 58 | 29.4 | 71.4 | -42.0 | 1.43 | 5 | 2 | .23 | .29 | 5.8 | 15 |
| DENVER-LARAMIE | 221 | 115 | 94.6 | 66.5 | 28.2 |  | 8 | 1 | .20 | .63 | 10.0 | 28 |
| DENVER-MC COOK | 238 | 224 | 160.2 | 206.5 | -46.3 | .29 | 8 | 2 | .70 | .49 | 15.8 | 30 |
| DEVILS LAKE-FARGO | 222 | 164 | 149.0 | 162.9 | -13.9 | .09 | 8 | 2 | .53 | .47 | 15.2 | 29 |
| FARGO-GRAND FORKS | 223 | 75 | 138.7 | 101.2 | 37.5 |  | 8 | 2 | .28 | .53 | 17.1 | 24 |
| FARGO-JAMESTOWN | 225 | 67 | 73.0 | 93.6 | -20.6 | .28 | 5 | 2 | .31 | .54 | 10.8 | 20 |
| FARGO-LISBON | 224 | 46 | 14.8 | 61.0 | -46.2 | 3.13 | 5 | 2 | .19 | .11 | 2.3 | 19 |
| FARGO-WAHPETON | 226 | 124 | 12.3 | 105.9 | -93.6 | 7.61 | 5 | 2 | .41 | .07 | 1.4 | 26 |
| GREAT FALLS-HAVRE | 201 | 107 | 45.6 | 102.3 | -56.6 | 1.24 | 5 | 2 | .36 | .38 | 7.5 | 18 |
| GREAT FALLS-KALISPELL | 202 | 139 | 129.3 | 140.5 | -11.2 | .09 | 8 | 2 | .46 | .48 | 15.3 | 25 |
| GREAT FALLS-SHELBY | 211 | 89 | 51.7 | 92.5 | -40.8 | .79 | 5 | 2 | .31 | .42 | 8.5 | 18 |
| HASTINGS-OMAHA | 218 | 141 | 203.0 | 149.7 | 53.2 |  | 8 | 2 | .47 | .57 | 18.2 | 33 |
| HURON-SIOUX FALLS | 229 | 79 | 153.2 | 107.5 | 45.6 |  | 8 | 2 | .29 | .64 | 20.6 | 22 |
| KALISPELL-SPOKANE | 203 | 167 | 1372.5 | 919.7 | 452.8 |  | 15 | 6 | 1.31 | .63 | 112.8 | 36 |
| MINOT-RUGBY | 236 | 63 | 25.0 | 72.3 | -47.3 | 1.89 | 5 | 2 | .24 | .18 | 3.7 | 20 |
| MINOT-STANLEY | 237 | 49 | 39.2 | 66.3 | -27.1 | .69 | 5 | 2 | .20 | .30 | 6.1 | 19 |
| NEWCASTLE-RAPID CITY | 232 | 75 | 29.1 | 79.8 | -50.7 | 1.74 | 5 | 2 | .27 | .20 | 4.1 | 21 |
| NORFOLK-OMAHA | 239 | 102 | 331.0 | 247.9 | 83.0 |  | 8 | 4 | .72 | .64 | 40.8 | 24 |
| N. PLATTE-OGALLALA | 209 | 53 | 29.4 | 68.4 | -39.0 | 1.33 | 5 | 2 | .21 | .29 | 5.8 | 15 |
| PHILLIP-RAPID CITY | 233 | 68 | 12.8 | 73.4 | -60.6 | 4.75 | 5 | 2 | .25 | .09 | 1.8 | 21 |
| SCOTTBLUFF-SIDNEY | 235 | 61 | 72.3 | 77.9 | -5.6 | .08 | 5 | 2 | .24 | .53 | 10.7 | 20 |
| SIOUX FALLS-WATERTOWN | 230 | 78 | 108.9 | 104.1 | 4.8 |  | 8 | 2 | .29 | .56 | 17.9 | 18 |
| SIOUX FALLS-YANKTON | 231 | 48 | 102.3 | 82.5 | 19.8 |  | 8 | 2 | .20 | .56 | 17.8 | 17 |

# OLD WEST ROUTE ANALYSIS OUTPUT FORMAT DESCRIPTION

# (MULTI-STOP ROUTES)

The multi-stop computer outputs are designed to provide visibility into the key characteristics of each route segment. It includes an origin and destination section identifying the city-pairs involved in the route, the two-way daily air passengers between each city-pair, the airway distance in statute miles for each segment, and a one-way fare in dollars. In some cases, a community is involved in more than one route (e.g. Norfolk, Nebraska, to Omaha). The total demand from Norfolk to Omaha is thus the sum of the non-stop route demand plus the Norfolk-Omaha segment demand of the multi-stop route.

The segment data section describes each flight segment in terms of on-board passengers and each segment's load factor.

The route data section summarizes, on a route basis, the annual revenue, direct and indirect operating costs, and resultant profit or loss. It also includes the number of hours per day the aircraft is operating (block time), the number of daily round trips, the recommended aircraft size, the number of aircraft required for the route based upon a desired 2500 hours yearly utilization, the average route load factor, and, where routes are unprofitable, a subsidy or loss ratio (loss or required subsidy divided by the revenue).

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                                                                NETWORK WITH SEASONALITY SEPT 9 197

                                  ROUTE 301: BROKEN BOW-COLUMBUS-OMAHA


                        ORIGIN AND DESTINATION                                          ROUTE DATA

                                         2-WAY    DISTANCE   ONE-WAY     ANNUAL
              CITY PAIR               DAILY PASS.  (S. MI.)    FARE
                                          (1)        (2)                   REVENUE (000)         179.7

      BROKEN BOW-COLUMBUS                  .0        112        .00        OPER. COST(000)       217.3

      COLUMBUS-OMAHA                      4.6         81      22.00        PROFIT/LOSS(000)      ¯37.6

      BROKEN BOW-OMAHA                   12.3                 35.00      BLOCK_TIME(DAILY HR)      4.7

                                                                         FREQUENCY(DAY)              2
                               SEGMENT DATA
                                                                         AIRCRAFT_SIZE               8

               SEGMENT               ON-BOARD PASS.   LOAD FACTOR        NO_OF_AIRCRAFT(3)         .66

                                                                         AVG_LOAD_FACTOR           .44
      BROKEN BOW-COLUMBUS                  12.3           .38
                                                                         LOSS_RATIO               .209
      COLUMBUS-OMAHA                       16.9           .53


        (1) ON THIS ROUTE
        (2) AIRWAY DISTANCE
        (3) BASED ON 2500 HR YEARLY
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                                                   NETWORK WITH SEASONALITY SEPT 9 1975

                       ROUTE 302: BISMARCK-DICKINSON-BOWMAN


                 ORIGIN AND DESTINATION                          ROUTE DATA

                               2-WAY     DISTANCE    ONE-WAY    ANNUAL
          CITY PAIR         DAILY PASS.  (S. MI.)     FARE
                                (1)        (2)                   REVENUE (000)         73.3

    BISMARCK-DICKINSON          6.0         51       24.00       OPER. COST(000)      160.8

    DICKINSON-BOWMAN             .0        100         .00       PROFIT/LOSS(000)     ¯87.5

    BISMARCK-BOWMAN             2.7                  27.00      BLOCK_TIME(DAILY HR)    3.8

                                                                FREQUENCY(DAY)            2
                       SEGMENT DATA
                                                                AIRCRAFT_SIZE             5

           SEGMENT             ON-BOARD PASS.   LOAD FACTOR     NO_OF_AIRCRAFT(3)       .55

                                                                AVG_LOAD_FACTOR         .24
    BISMARCK-DICKINSON              8.7             .43
                                                                LOSS_RATIO            1.193
    DICKINSON-BOWMAN                2.7             .13


      (1) ON THIS ROUTE
      (2) AIRWAY DISTANCE
      (3) BASED ON 2500 HR YEARLY
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                                                         NETWORK WITH SEASONALITY SEPT 9 1975


                          ROUTE 303: CASPER-WORLAND-CODY


              ORIGIN AND DESTINATION                                     ROUTE DATA


                                2-WAY   DISTANCE   ONE-WAY    ANNUAL
        CITY PAIR            DAILY PASS.  (S. MI.)   FARE
                                 (1)        (2)                 REVENUE (000)        310.3

  CASPER-WORLAND                17.4        122      25.00      OPER. COST(000)      395.3

  WORLAND-CODY                    .0         80        .00      PROFIT/LOSS(000)     ¯85.0

  CASPER-CODY                   15.1                 32.00    BLOCK_TIME(DAILY HR)     4.0

                                                              FREQUENCY(DAY)             2
                       SEGMENT DATA
                                                              AIRCRAFT_SIZE             15

           SEGMENT            ON-BOARD PASS.   LOAD FACTOR    NO_OF_AIRCRAFT(3)        .58

                                                              AVG_LOAD_FACTOR          .43
  CASPER-WORLAND                  32.5            .54
                                                              LOSS_RATIO              .274
  WORLAND-CODY                    15.1            .25


     (1) ON THIS ROUTE
     (2) AIRWAY DISTANCE
     (3) BASED ON 2500 HR YEARLY
```

## ROUTE 304: BILLINGS-BUTTE-DILLON

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| BILLINGS-BUTTE | 14.0 | 191 | 35.00 |
| BUTTE-DILLON | 1.1 | 48 | 19.00 |
| BILLINGS-DILLON | 6.6 | | 32.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| BILLINGS-BUTTE | 20.6 | .64 |
| BUTTE-DILLON | 7.7 | .24 |

### ROUTE DATA

| ANNUAL | |
|---|---|
| REVENUE (000) | 244.1 |
| OPER. COST(000) | 255.7 |
| PROFIT/LOSS(000) | -11.7 |
| BLOCK TIME(DAILY HR) | 5.6 |
| FREQUENCY(DAY) | 2 |
| AIRCRAFT SIZE | 8 |
| NO OF AIRCRAFT(3) | .81 |
| AVG LOAD FACTOR | .56 |
| LOSS RATIO | .048 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

```
                                                         NETWORK WITH SEASONALITY SEPT 9 1975


                        ROUTE 305: BILLINGS-FORSYTH-MILES CITY


                  ORIGIN AND DESTINATION                                   ROUTE DATA


                                 2-WAY     DISTANCE   ONE-WAY    ANNUAL
          CITY PAIR           DAILY PASS.  (S. MI.)    FARE
                                 (1)         (2)                   REVENUE (000)        66.9

     BILLINGS-FORSYTH            4.0         111       20.00       OPER. COST(000)     159.8

     FORSYTH-MILES CITY           .0          35         .00       PROFIT/LOSS(000)    -92.9

     BILLINGS-MILES CITY         5.9                   20.00     BLOCK_TIME(DAILY HR)    3.7

                                                                 FREQUENCY(DAY)            2
                         SEGMENT DATA
                                                                 AIRCRAFT_SIZE             5

             SEGMENT          ON-BOARD PASS.   LOAD FACTOR       NO_OF_AIRCRAFT(3)       .54

                                                                 AVG_LOAD_FACTOR         .45
     BILLINGS-FORSYTH                9.9           .49
                                                                 LOSS_RATIO            1.386
     FORSYTH-MILES CITY              5.9           .29


       (1) ON THIS ROUTE
       (2) AIRWAY DISTANCE
       (3) BASED ON 2500 HR YEARLY
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                                                                     NETWORK WITH SEASONALITY SEPT 9 1975

                               ROUTE 306: BILLINGS-GLENDIVE-SIDNEY

                    ORIGIN AND DESTINATION                                        ROUTE DATA

                                  2-WAY      DISTANCE    ONE-WAY    ANNUAL
          CITY PAIR            DAILY PASS.  (S. MI.)    FARE
                                   (1)         (2)                     REVENUE (000)          228.7

BILLINGS-GLENDIVE                 14.1        209        31.00        OPER. COST(000)        269.5

GLENDIVE-SIDNEY                     .0         51          .00        PROFIT/LOSS(000)       ¯40.9

BILLINGS-SIDNEY                    6.3                    38.00     BLOCK_TIME(DAILY HR)      6.0

                                                                    FREQUENCY(DRT)              2
                       SEGMENT DATA
                                                                    AIRCRAFT_SIZE               8

           SEGMENT               ON-BOARD PASS.   LOAD FACTOR      NO_OF_AIRCRAFT(3)         .87

                                                                    AVG_LOAD_FACTOR           .55
BILLINGS-GLENDIVE                     20.4              .64
                                                                    LOSS_RATIO               .179
GLENDIVE-SIDNEY                        6.3              .20


  (1) ON THIS ROUTE
  (2) AIRWAY DISTANCE
  (3) BASED ON 2500 HR YEARLY
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                                          NETWORK WITH SEASONALITY SEPT 9 1975


                     ROUTE 307: BILLINGS-GLASGOW-WOLF PT.


                ORIGIN AND DESTINATION                          ROUTE DATA

                                2-WAY    DISTANCE   ONE-WAY    ANNUAL
          CITY PAIR          DAILY PASS. (S. MI.)    FARE
                                (1)        (2)                   REVENUE (000)       195.9

  BILLINGS-GLASGOW             10.8        188      31.00        OPER. COST(000)     249.7

  GLASGOW-WOLF PT.               .0         49        .00        PROFIT/LOSS(000)    ¯53.8

  BILLINGS-WOLF PT.             6.8                 36.00      BLOCK_TIME(DAILY HR)    5.5

                                                               FREQUENCY(DRT)            2
                     SEGMENT DATA
                                                               AIRCRAFT_SIZE             8

           SEGMENT             ON-BOARD PASS.   LOAD FACTOR    NO_OF_AIRCRAFT(3)       .81

                                                               AVG_LOAD_FACTOR         .48
  BILLINGS-GLASGOW                 17.6            .55
                                                               LOSS_RATIO             .275
  GLASGOW-WOLF PT.                  6.8            .21


     (1) ON THIS ROUTE
     (2) AIRWAY DISTANCE
     (3) BASED ON 2500 HR YEARLY
```

## ROUTE 308: CASPER-RAWLINS-SARATOGA

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| CASPER-RAWLINS | 16.1 | 97 | 21.00 |
| RAWLINS-SARATOGA | .0 | 26 | .00 |
| CASPER-SARATOGA | 2.8 | | 22.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| CASPER-RAWLINS | 18.9 | .59 |
| RAWLINS-SARATOGA | 2.8 | .09 |

### ROUTE DATA

| ANNUAL | |
|---|---|
| REVENUE (000) | 135.1 |
| OPER. COST(000) | 169.4 |
| PROFIT/LOSS(000) | -34.3 |
| BLOCK_TIME(DAILY HR) | 3.3 |
| FREQUENCY(DRT) | 2 |
| AIRCRAFT_SIZE | 8 |
| NO_OF_AIRCRAFT(3) | .49 |
| AVG_LOAD_FACTOR | .48 |
| LOSS_RATIO | .254 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

```
                    ROUTE 309: KEMMERER-EVANSTON-SALT LAKE


          ORIGIN AND DESTINATION                           ROUTE DATA


                                2-WAY   DISTANCE   ONE-WAY   ANNUAL
         CITY PAIR         DAILY PASS.  (S. MI.)   FARE
                                 (1)       (2)                 REVENUE (000)       150.9

KEMMERER-EVANSTON                .0        65        .00       OPER. COST(000)     167.1

EVANSTON-SALT LAKE              13.7       55      22.00       PROFIT/LOSS(000)    -16.3

KEMMERER-SALT LAKE               5.8               25.00     BLOCK_TIME(DAILY HR)    3.3

                                                             FREQUENCY(DRT)            2
                    SEGMENT DATA
                                                             AIRCRAFT_SIZE             8

          SEGMENT          ON-BOARD PASS.   LOAD FACTOR      NO_OF_AIRCRAFT(3)       .48

                                                             AVG_LOAD_FACTOR         .38
KEMMERER-EVANSTON                 5.8           .18
                                                             LOSS_RATIO             .108
EVANSTON-SALT LAKE               19.5           .61


   (1) ON THIS ROUTE
   (2) AIRWAY DISTANCE
   (3) BASED ON 2500 HR YEARLY
```

## ROUTE 310: BISMARCK-MINOT-WILLISTON

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| BISMARCK-MINOT | 9.4 | 87 | 26.00 |
| MINOT-WILLISTON | 7.2 | 114 | 25.00 |
| BISMARCK-WILLISTON | 8.1 | | 28.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| BISMARCK-MINOT | 17.5 | .55 |
| MINOT-WILLISTON | 15.3 | .48 |

### ROUTE DATA

| ANNUAL | |
|---|---|
| REVENUE (000) | 220.1 |
| OPER. COST(000) | 230.5 |
| PROFIT/LOSS(000) | ¯10.4 |
| BLOCK_TIME(DAILY HR) | 4.8 |
| FREQUENCY(DAY) | 2 |
| AIRCRAFT_SIZE | 8 |
| NO_OF_AIRCRAFT(3) | .71 |
| AVG_LOAD_FACTOR | .51 |
| LOSS_RATIO | .047 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 311: SIOUX FALLS-MITCHELL-WINNER

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| SIOUX FALLS-MITCHELL | 10.4 | 58 | 24.00 |
| MITCHELL-WINNER | 2.3 | 92 | 23.00 |
| SIOUX FALLS-WINNER | 5.0 | | 33.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| SIOUX FALLS-MITCHELL | 15.4 | .48 |
| MITCHELL-WINNER | 7.3 | .23 |

### ROUTE DATA

| | |
|---|---|
| ANNUAL | |
| REVENUE (000) | 158.0 |
| OPER. COST(000) | 186.5 |
| PROFIT/LOSS(000) | -28.4 |
| BLOCK_TIME(DAILY HR) | 3.9 |
| FREQUENCY(DAY) | 2 |
| AIRCRAFT_SIZE | 8 |
| NO_OF_AIRCRAFT(3) | .56 |
| AVG_LOAD_FACTOR | .33 |
| LOSS_RATIO | .180 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

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                                                                         NETWORK WITH SEASONALITY SEPT 9 1975

                         ROUTE 312: PINE RIDGE-CHADRON-SCOTTSBLUFF


                    ORIGIN AND DESTINATION                                        ROUTE DATA

                                  2-WAY    DISTANCE   ONE-WAY    ANNUAL
            CITY PAIR          DAILY PASS.  (S. MI.)    FARE
                                   (1)        (2)                  REVENUE (000)          87.3

PINE RIDGE-CHADRON                  .0        31         .00       OPER. COST(000)       132.2

CHADRON-SCOTTSBLUFF                4.9        68       23.00       PROFIT/LOSS(000)      -44.9

PINE RIDGE-SCOTTSBLUFF             5.6                 26.00     BLOCK_TIME(DAILY HR)    2.8

                                                                 FREQUENCY(DRT)            2
                         SEGMENT DATA
                                                                 AIRCRAFT_SIZE             5

           SEGMENT              ON-BOARD PASS.   LOAD FACTOR     NO_OF_AIRCRAFT(3)       .41

                                                                 AVG_LOAD_FACTOR         .45
PINE RIDGE-CHADRON                    5.6           .28
                                                                 LOSS_RATIO             .514
CHADRON-SCOTTSBLUFF                  10.5           .52


   (1) ON THIS ROUTE
   (2) AIRWAY DISTANCE
   (3) BASED ON 2500 HR YEARLY
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                                                                NETWORK WITH SEASONALITY SEPT 9 1975

                              ROUTE 313: DENVER-LARAMIE-SARATOGA

                     ORIGIN AND DESTINATION                                    ROUTE DATA

                                 2-WAY     DISTANCE    ONE-WAY      ANNUAL
          CITY PAIR           DAILY PASS.  (S. MI.)    FARE
                                  (1)         (2)                     REVENUE (000)           173.5

   DENVER-LARAMIE                 17.3        115       28.00        OPER. COST(000)         204.5

   LARAMIE-SARATOGA                 .0         59         .00        PROFIT/LOSS(000)        -31.0

   DENVER-SARATOGA                 1.0                  29.00      BLOCK_TIME(DAILY HR)        4.3

                                                                   FREQUENCY(DRT)                2
                             SEGMENT DATA
                                                                   AIRCRAFT_SIZE                 8

            SEGMENT              ON-BOARD PASS.   LOAD FACTOR      NO_OF_AIRCRAFT(3)           .63

                                                                   AVG_LOAD_FACTOR             .39
   DENVER-LARAMIE                   18.3            .57
                                                                   LOSS_RATIO                 .178
   LARAMIE-SARATOGA                  1.0            .03


     (1) ON THIS ROUTE
     (2) AIRWAY DISTANCE
     (3) BASED ON 2500 HR YEARLY
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                    ROUTE 314: MC COOK-KEARNEY-OMAHA


          ORIGIN AND DESTINATION                            ROUTE DATA


                             2-WAY    DISTANCE   ONE-WAY    ANNUAL
        CITY PAIR          DAILY PASS.  (S. MI.)   FARE
                               (1)        (2)                 REVENUE (000)        194.8

MC COOK-KEARNEY                .0          55        .00      OPER. COST(000)      240.1

KEARNEY-OMAHA                13.6         167      29.00      PROFIT/LOSS(000)     -45.3

MC COOK-OMAHA                 5.2                  35.00    BLOCK_TIME(DAILY HR)    5.3

                                                            FREQUENCY(DAY)            2
                   SEGMENT DATA
                                                            AIRCRAFT_SIZE             8

        SEGMENT             ON-BOARD PASS.   LOAD FACTOR    NO_OF_AIRCRAFT(3)       .77

                                                            AVG_LOAD_FACTOR         .48
MC COOK-KEARNEY                  5.2            .16
                                                            LOSS_RATIO             .232
KEARNEY-OMAHA                   18.8            .59



    (1) ON THIS ROUTE
    (2) AIRWAY DISTANCE
    (3) BASED ON 2500 HR YEARLY
```

## ROUTE 515: HOLDREGE-HASTINGS-OMAHA

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| HOLDREGE-HASTINGS | .0 | 61 | .00 |
| HASTINGS-OMAHA | 10.0 | 141 | 30.00 |
| HOLDREGE-OMAHA | 9.9 | | 35.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| HOLDREGE-HASTINGS | 9.9 | .31 |
| HASTINGS-OMAHA | 19.9 | .62 |

### ROUTE DATA

| ANNUAL | |
|---|---|
| REVENUE (000) | 218.5 |
| OPER. COST(000) | 227.2 |
| PROFIT/LOSS(000) | -8.7 |
| BLOCK TIME(DAILY HR) | 4.9 |
| FREQUENCY(DAY) | 2 |
| AIRCRAFT SIZE | 8 |
| NO OF AIRCRAFT(3) | .71 |
| AVG LOAD FACTOR | .53 |
| LOSS RATIO | .040 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

# ROUTE 316: FAIRBURY-LINCOLN-OMAHA

## ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| FAIRBURY-LINCOLN | 4.7 | 55 | 20.00 |
| LINCOLN-OMAHA | .0 | 55 | .00 |
| FAIRBURY-OMAHA | 12.3 | | 24.00 |

## SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| FAIRBURY-LINCOLN | 17.0 | .53 |
| LINCOLN-OMAHA | 12.3 | .38 |

## ROUTE DATA

| ANNUAL | |
|---|---|
| REVENUE (000) | 131.5 |
| OPER. COST(000) | 158.3 |
| PROFIT/LOSS(000) | ⁻26.8 |
| BLOCK_TIME(DAILY HR) | 3.1 |
| FREQUENCY(LRT) | 2 |
| AIRCRAFT_SIZE | 8 |
| NO_OF_AIRCRAFT(3) | .45 |
| AVG_LOAD_FACTOR | .46 |
| LOSS_RATIO | .204 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 317: OMAHA-NORFOLK-O'NEILL-AINSWORTH-VALENTINE

### Origin & Destination

| City Pair | 2-Way Daily Pass.[1] | Distance (S. Mi.)[2] | One-Way Fare |
|---|---|---|---|
| Omaha-Norfolk | 3.0 | 102 | 24 |
| Omaha-O'Neill | 9.9 | - | 30 |
| Omaha-Ainsworth | 3.5 | - | 36 |
| Omaha-Valentine | 4.0 | - | 38 |
| Norfolk-O'Neill | 2.0 | 70 | 21 |
| Norfolk-Ainsworth | .6 | - | 27 |
| Norfolk-Valentine | 0 | - | - |
| Ainsworth-O'Neill | - | 67 | - |
| Ainsworth-Valentine | - | 37 | - |

### Route Data

Annual

| | |
|---|---|
| Revenue (000) | 238.4 |
| Oper. Cost (000) | 347.3 |
| Profit/Loss (000) | -108.9 |
| Block Time (Daily Hr.) | 7.24 |
| Frequency (DRT) | 2 |
| Aircraft Size | 8 |
| No. of Aircraft[3]: | 1.06 |
| Ave. Load Factor | 47% |
| Loss Ratio | .46 |

### Segment Data

| Segment | On-Board Pass. | Load Factor |
|---|---|---|
| Omaha-Norfolk | 20.4 | 64% |
| Norfolk-O'Neill | 20.0 | 63% |
| O'Neill-Ainsworth | 8.1 | 25% |
| Ainsworth-Valentine | 4.0 | 13% |

---

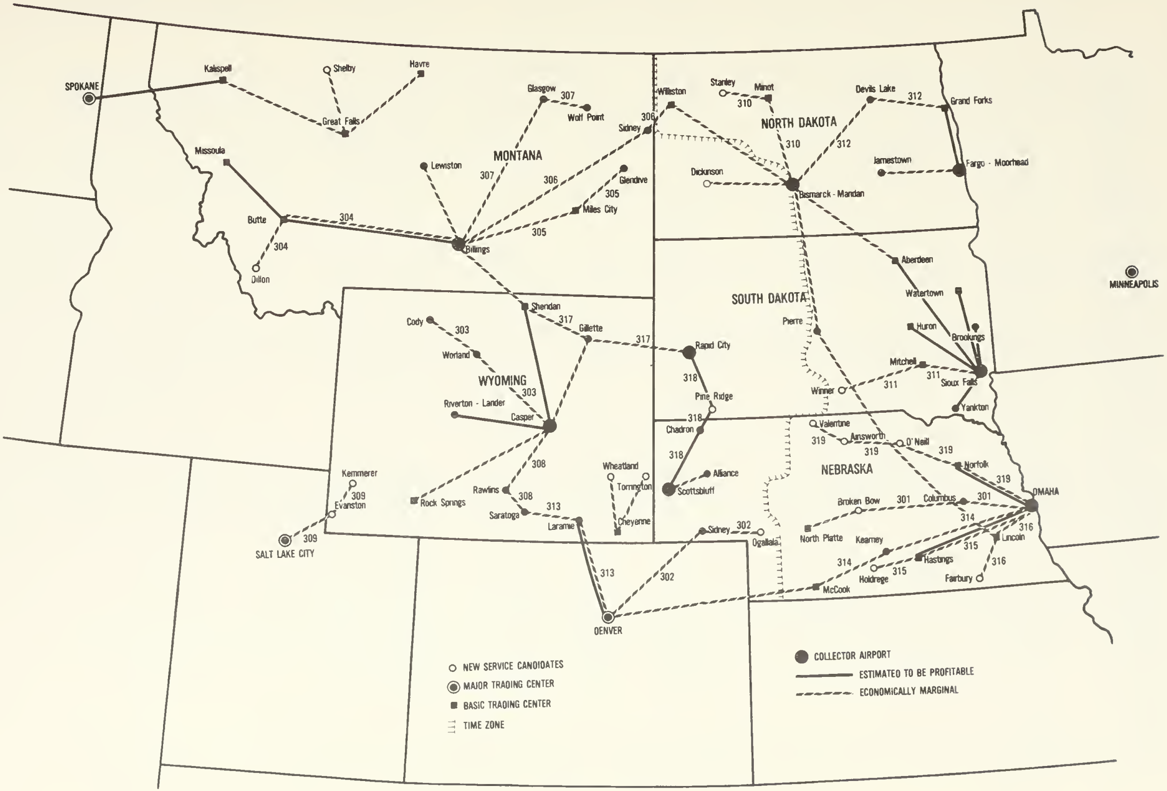
[1] On This Route

[2] Airway Distance

[3] Based on 2500 Hours Yearly

- RECOMMENDED COMMUTER AIR SERVICE SYSTEM (Map)
- NOMINAL DEMAND
- RECOMMENDED SYSTEM (Mature 1976 Demand; 12.35% Average Annual ROI)
- RECOMMENDED SYSTEM (Mature 1976 Demand; No ROI)
- RECOMMENDED SYSTEM (First Year Demand Build-Up; No ROI)

# Recommended Commuter Air Service System



# NOMINAL DEMAND ANALYSIS FORMAT DESCRIPTION

The attached computer run identifies the city-pairs being analyzed in the noted air service concept and includes the following information:

- Type. The city-pair type, A, B, or C, is entered in this column (refer to Determination of Air Demand for definition of Type A, B, and C categories). Where an R or an S follows the type entry, it indicates either a recent internal revision or special consideration for analysis due to distance or population factors.

- Number. This entry is simply a city-pair number assigned for analysis convenience in the computer program.

- Distance. Air distance between city-pair in statue miles.

- Fare. Nominal air fare based on current air fares charged in the Old West Region ($15 plus 8.5 cents per mile).

- 1976 and 1985 Demand. These columns represent the two-way daily person trips by air forecasted for the noted time periods. They include local O&D as well as connecting passengers (both on-line and interline).

## OLD WEST RECOMMENDED NETWORK NOMINAL FARE AND DEMAND

| CITY | PAIR | TYPE | NO. | DIST. | FARE | 76DEMAND | 85DEMAND |
|---|---|---|---|---|---|---|---|
| ABERDEEN | BISMARCK | AR | 68 | 148 | $28 | 9.8 | 9.0 |
| ABERDEEN | MOBRIDGE | C | 46 | 101 | $24 | 3.2 | 3.7 |
| ABERDEEN | SIOUX FAL | AR | 70 | 145 | $27 | 42.5 | 43.7 |
| AINSWORTH | OMAHA | B | 116 | 245 | $36 | 8.3 | 8.7 |
| AINSWORTH | NORFOLK | BS | 27 | 136 | $27 | 1.2 | 1.3 |
| ALLIANCE | SCOTTSBLF | A | 17 | 37 | $18 | 6.3 | 6.5 |
| BILLINGS | BUTTE | A | 99 | 191 | $31 | 39.6 | 47.6 |
| BILLINGS | DILLON | C | 123 | 196 | $32 | 8.7 | 9.0 |
| BILLINGS | GLASGOW | C | 127 | 188 | $31 | 10.8 | 15.6 |
| BILLINGS | GLENDIVE | C | 11 | 209 | $33 | 11.5 | 12.6 |
| BILLINGS | LEWISTON | A | 102 | 101 | $24 | 4.6 | 5.3 |
| BILLINGS | MILES CTY | A | 12 | 134 | $26 | 5.2 | 5.7 |
| BILLINGS | SHERIDAN | A | 60 | 101 | $24 | 7.4 | 9.1 |
| BILLINGS | SIDNEY | A | 10 | 265 | $38 | 8.3 | 9.4 |
| BILLINGS | WILLISTON | A |  | 284 | $39 | 8.7 | 9.4 |
| BILLINGS | WOLF PT. | C | 128 | 249 | $36 | 9.0 | 10.2 |
| BISMARCK | DEVILS LK | C | 36 | 130 | $26 | 7.5 | 7.5 |
| BISMARCK | DICKINSON | C | 34 | 100 | $24 | 6.0 | 5.3 |
| BISMARCK | GRD FORKS | C |  | 186 | $31 | 24.0 | 23.4 |
| BISMARCK | MINOT | A | 72 | 106 | $24 | 12.6 | 12.0 |
| BISMARCK | PIERRE | C | 44 | 266 | $38 | 8.6 | 8.6 |
| BISMARCK | STANLEY | CS | 132 | 162 | $29 | 2.1 | 2.1 |
| BISMARCK | WILLISTON | C | 30 | 193 | $31 | 9.2 | 7.8 |
| BROKENBOW | N.PLATTE | B |  | 65 | $21 | 6.0 | 6.0 |
| BROKENBOW | OMAHA | B | 117 | 193 | $31 | 21.4 | 21.6 |
| BROOKING | SIOUX FAL | A | 133 | 46 | $19 | 9.6 | 10.4 |
| BUTTE | DILLON | C | 90 | 48 | $19 | 1.1 | 1.1 |
| BUTTE | MISSOULA | CS | 125 | 107 | $24 | 53.7 | 61.7 |
| CASPER | CODY | A | 110 | 201 | $32 | 21.6 | 23.6 |
| CASPER | GILLETTE | B | 112 | 103 | $24 | 9.4 | 10.3 |
| CASPER | RAWLINS | B | 113 | 97 | $23 | 12.2 | 14.9 |
| CASPER | RIVERTON | A | 93 | 101 | $24 | 42.6 | 47.7 |
| CASPER | ROCK SPR | A | 114 | 160 | $29 | 5.4 | 6.9 |
| CASPER | SARATOGA | B | 115 | 113 | $25 | 3.2 | 3.7 |
| CASPER | SHERIDAN | A | 94 | 131 | $23 | 60.6 | 67.7 |
| CASPER | WORLAND | A | 95 | 122 | $25 | 17.4 | 18.7 |
| CHADRON | RAPID CTY | C |  | 83 | $22 | 5.6 | 6.2 |
| CHADRON | SCOTTSBLF | A | 15 | 68 | $21 | 12.0 | 12.7 |
| CHEYENNE | TORRINGTN | B | 67 | 69 | $21 | 3.5 | 4.1 |
| CHEYENNE | WHEATLAND | B | 66 | 58 | $20 | 3.0 | 3.7 |
| COLUMBUS | OMAHA | A | 76 | 81 | $22 | 4.6 | 5.2 |
| DENVER | KEARNEY | A | 108 | 318 | $42 | 17.4 | 22.0 |
| DENVER | LARAMIE | A | 104 | 115 | $25 | 24.3 | 29.6 |
| DENVER | MCCOOK | A | 22 | 224 | $34 | 11.0 | 13.0 |
| DENVER | OGALLALA | CS |  | 177 | $30 | 12.5 | 15.5 |
| DENVER | SARATOGA | CS | 138 | 165 | $29 | 1.7 | 2.1 |

```
DENVER    SIDNEY    A         136       $27       6.0       7.0
DEVILS LK GRD FORKS A    37   80       $22        9.8       11.8
EVANSTON  SALT LAKE B    53   65        $20       15.9      17.5
FAIRBURY  LINCOLN   BS   26   55        $20       4.7       4.8
FAIRBURY  OMAHA     B    118  105       $24       18.9      18.9
FARGO     GRD FORKS A    105  75        $21       21.4      25.8
FARGO     JAMESTOWN C    39   87        $22       8.1       9.0
GILLETTE  RAPID CTY C         120       $25       9.6       11.2
GRT FALLS HAVRE     A    4    107       $24       3.9       4.5
GRT FALLS KALISPELL A    2    139       $27       12.1      14.6
GRT FALLS SHELBY    C    3    89        $22       5.1       5.1
HASTINGS  OMAHA     A    106  141       $27       24.1      25.5
HOLDREGE  OMAHA     B    119  199       $32       16.3      17.9
HURON     SIOUX FAL A    81   79        $22       20.6      20.9
KALISPELL SPOKANE   A    1    167       $29       68.2      67.4
KEARNEY   OMAHA     A    107  167       $29       13.6      15.1
KEMMERER  SALT LAKE B    56   116       $25       9.7       11.0
MCCOOK    OMAHA     A    109  232       $35       7.4       7.7
MINOT     STANLEY   C    32   49        $19       4.8       4.8
MITCHELL  SIOUX FAL A    83   58        $20       14.4      15.1
MITCHELL  WINNER    C    47   92        $23       2.3       2.3
NORFOLK   OMAHA     A    85   102       $24       21.8      25.0
NORFOLK   ONEILL    B    28   70        $21       2.0       2.4
NORFOLK   VALENTINE BS   137  173      $30        3.9       4.2
OMAHA     ONEILL    B    121  178       $30       16.3      17.9
OMAHA     VALENTINE B    122  270       $38       9.0       9.7
PINERIDGE RAPID CTY C         74        $21       7.6       9.5
PINERIDGE SCOTTSBLF CS   92   99        $23       10.5      11.0
RAPID CTY SCOTTSBLF CS        146       $27       11.0      12.3
RAPID CTY SHERIDAN  C         200       $32       17.6      20.8
SIOUX FAL WATERTOWN A    88   78        $22       10.7      11.1
SIOUX FAL WINNER    C    97   153       $28       11.0      11.7
SIOUX FAL YANKTON   A    89   48        $19       12.8      13.4




                                                0081 CARDS
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- ROUTE ANALYSIS OUTPUT
  (Non-Stop Routes)
- ROUTE ANALYSIS OUTPUT
  (Multi-Stop Routes)

# OLD WEST ROUTE ANALYSIS OUTPUT FORMAT DESCRIPTION

## ( NON-STOP ROUTES )

| Route Name | Route No. | Revenue (000) | Cost (000) | P/L $(000) | Loss Ratio | A/C Ratio | Freq. DRT | No. A/C | PLF | Pass/ Day | Fare |
|---|---|---|---|---|---|---|---|---|---|---|---|

Revenue = Annual route revenue in dollars

Cost = Route annual direct and indirect operating cost (including a 12. 35% average annual return on investment in dollars)

P/L = Annual route profit or loss

Loss Ratio = Loss (required subsidy) divided by revenue

A/C Cap = Aircraft passenger capacity

Freq (DRT) = Service frequency in daily round trips

No. A/C = Fraction of aircraft required on route at 2500 hours annual utilization

PLF = Passenger load factor (average of total route)

Pass/Day = Number of two way daily passengers between communites

Fare = One-way fare related to noted passenger demand

FINAL NETWORK SEPT. 22 1975

| ROUTE (CITY-PAIR) | RT. NO. | DIST | REVENUE (000) | COST (000) | P/L (000) | LOSS RATIO | A/C CAP | FREQ DAY | NO. A/C | FLF | PASS/ DAY | FARE (OW) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ABERDEEN-BISMARCK | 224 | 148 | 139.2 | 154.5 | -15.3 | .11 | 8 | 2 | .49 | .55 | 17.9 | 23 |
| ABERDEEN-SIOUX FALLS | 228 | 145 | 490.8 | 406.8 | 83.9 | | 15 | 3 | .56 | .54 | 46.4 | 30 |
| ALLIANCE-SCOTTSBLUFF | 234 | 57 | 56.2 | 69.9 | -13.7 | .24 | 8 | 2 | .17 | .40 | 12.8 | 13 |
| BILLINGS-BUTTE | 212 | 126 | 622.2 | 373.4 | 248.8 | | 15 | 3 | .52 | .58 | 52.6 | 35 |
| BILLINGS-LEWISTOWN | 215 | 101 | 55.2 | 112.1 | -57.0 | 1.03 | 8 | 2 | .35 | .30 | 9.6 | 17 |
| BILLINGS-SHERIDAN | 213 | 101 | 81.1 | 114.6 | -33.5 | .41 | 8 | 2 | .35 | .36 | 12.6 | 20 |
| BISMARCK-DICKINSON | 204 | 100 | 71.8 | 114.4 | -42.6 | .59 | 8 | 2 | .35 | .39 | 12.5 | 17 |
| BISMARCK-PIERRE | 209 | 266 | 134.9 | 233.3 | -98.4 | .73 | 8 | 2 | .82 | .42 | 13.3 | 30 |
| BISMARCK-WILLISTON | 222 | 193 | 139.9 | 186.9 | -47.0 | .34 | 8 | 2 | .62 | .56 | 18.0 | 23 |
| BROKEN BOW-N. PLATTE | 237 | 65 | 62.4 | 89.4 | -27.0 | .43 | 8 | 2 | .25 | .38 | 12.3 | 15 |
| BROOKINGS-SIOUX FALLS | 206 | 50 | 65.7 | 63.1 | 2.6 | | 8 | 2 | .21 | .53 | 16.9 | 15 |
| BUTTE-MISSOULA | 214 | 107 | 828.6 | 562.1 | 265.5 | | 15 | 5 | .76 | .61 | 90.8 | 27 |
| CASPER-GILLETTE | 217 | 103 | 112.0 | 123.6 | -11.7 | .10 | 8 | 2 | .36 | .61 | 19.5 | 17 |
| CASPER-RIVERTON | 210 | 101 | 446.4 | 321.5 | 125.0 | | 15 | 3 | .44 | .56 | 50.8 | 26 |
| CASPER-ROCK SPRINGS | 219 | 180 | 77.4 | 155.2 | -77.8 | 1.01 | 8 | 2 | .52 | .34 | 10.9 | 21 |
| CASPER-SHERIDAN | 205 | 131 | 958.2 | 766.6 | 191.6 | | 15 | 6 | 1.07 | .56 | 105.0 | 27 |
| CHEYENNE-TORRINGTON | 207 | 69 | 36.5 | 67.2 | -30.7 | 1.39 | 8 | 2 | .26 | .22 | 7.2 | 15 |
| CHEYENNE-WHEATLAND | 208 | 58 | 29.8 | 78.6 | -48.8 | 1.64 | 8 | 2 | .23 | .20 | 6.3 | 14 |
| DENVER-LARAMIE | 221 | 115 | 94.6 | 66.5 | 28.2 | | 8 | 1 | .20 | .63 | 10.0 | 28 |
| DENVER-MC COOK | 238 | 224 | 160.2 | 206.5 | -46.3 | .29 | 8 | 2 | .70 | .49 | 15.8 | 30 |
| FARGO-GRAND FORKS | 223 | 75 | 138.7 | 101.2 | 37.5 | | 8 | 2 | .28 | .53 | 17.1 | 24 |
| FARGO-JAMESTOWN | 225 | 87 | 85.6 | 107.6 | -22.0 | .26 | 8 | 2 | .32 | .47 | 14.9 | 17 |
| GREAT FALLS-HAVRE | 201 | 107 | 46.5 | 114.8 | -68.2 | 1.47 | 8 | 2 | .37 | .25 | 6.1 | 17 |
| GREAT FALLS-KALISPELL | 202 | 139 | 163.1 | 255.7 | -92.6 | .57 | 15 | 2 | .37 | .42 | 25.4 | 19 |
| GREAT FALLS-SHELBY | 211 | 89 | 55.7 | 104.4 | -48.7 | .87 | 8 | 2 | .32 | .32 | 10.3 | 16 |
| HASTINGS-OMAHA | 218 | 141 | 203.0 | 149.7 | 53.2 | | 8 | 2 | .47 | .57 | 18.2 | 33 |
| HURON-SIOUX FALLS | 229 | 79 | 153.2 | 107.5 | 45.6 | | 8 | 2 | .29 | .64 | 20.8 | 22 |
| KALISPELL-SPOKANE | 203 | 167 | 1372.5 | 919.7 | 452.8 | | 15 | 6 | 1.31 | .63 | 112.8 | 36 |
| LINCOLN-PIERRE | 216 | 351 | 194.7 | 295.3 | -100.6 | .52 | 8 | 2 | 1.06 | .45 | 14.4 | 40 |
| ~~MINNEAPOLIS-WATERTOWN~~ | ~~220~~ | ~~193~~ | ~~526.6~~ | ~~499.6~~ | ~~26.6~~ | | ~~15~~ | ~~3~~ | ~~.74~~ | ~~.51~~ | ~~46.6~~ | ~~34~~ |
| NORFOLK-OMAHA | 239 | 102 | 331.0 | 247.9 | 83.0 | | 8 | 4 | .72 | .64 | 40.8 | 24 |
| SIOUX FALLS-WATERTOWN | 230 | 78 | 108.9 | 104.1 | 4.8 | | 8 | 2 | .29 | .56 | 17.9 | 18 |
| SIOUX FALLS-YANKTON | 231 | 48 | 102.3 | 82.5 | 19.8 | | 8 | 2 | .20 | .56 | 17.8 | 17 |
| ZERO-A | 227 | 101 | 26.0 | 94.2 | -68.3 | 2.63 | 5 | 2 | .34 | .16 | 3.2 | 24 |
| ZERO-B | 232 | 75 | 29.1 | 79.8 | -50.7 | 1.74 | 5 | 2 | .27 | .20 | 4.1 | 21 |
| ZERO-C | 233 | 68 | 12.8 | 73.4 | -60.6 | 4.75 | 5 | 2 | .25 | .09 | 1.8 | 21 |
| ZERO-D | 236 | 63 | 25.0 | 72.3 | -47.3 | 1.89 | 5 | 2 | .24 | .18 | 3.7 | 20 |
| ZERO-E | 226 | 134 | 63.2 | 119.9 | -56.7 | .90 | 5 | 2 | .44 | .44 | 8.9 | 21 |
| ZERO-F | 235 | 61 | 72.3 | 77.9 | -5.6 | .08 | 5 | 2 | .24 | .53 | 10.7 | 20 |

# OLD WEST ROUTE ANALYSIS OUTPUT FORMAT DESCRIPTION (MULTI-STOP ROUTES)

The multi-stop computer outputs are designed to provide visibility into the key characteristics of each route segment. It includes an origin and destination section identifying the city-pairs involved in the route, the two-way daily air passengers between each city-pair, the airway distance in statute miles for each segment, and a one-way fare in dollars. In some cases, a community is involved in more than one route (e.g. Norfolk, Nebraska, to Omaha). The total demand from Norfolk to Omaha is thus the sum of the non-stop route demand plus the Norfolk-Omaha segment demand of the multi-stop route.

The segment data section describes each flight segment in terms of on-board passengers and each segment's load factor.

The route data section summarizes, on a route basis, the annual revenue, direct and indirect operating costs, and resultant profit or loss. It also includes the number of hours per day the aircraft is operating (block time), the number of daily round trips, the recommended aircraft size, the number of aircraft required for the route based upon a desired 2500 hours yearly utilization, the average route load factor, and, where routes are unprofitable, a subsidy or loss ratio (loss or required subsidy divided by the revenue).

ROUTE 801: BROKEN BOW-COLUMBUS-OMAHA

ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| BROKEN BOW-COLUMBUS | .0 | 112 | .00 |
| COLUMBUS-OMAHA | 4.6 | 81 | 22.00 |
| BROKEN BOW-OMAHA | 12.3 | | 35.00 |

ROUTE DATA

| ANNUAL | |
|---|---|
| REVENUE (000) | 179.7 |
| OPER. COST(000) | 217.3 |
| PROFIT/LOSS(000) | -37.6 |
| BLOCK TIME(DAILY HR) | 4.7 |
| FREQUENCY(DAY) | 2 |
| AIRCRAFT SIZE | 8 |
| NO OF AIRCRAFT(3) | .66 |
| AVG LOAD FACTOR | .44 |
| LOSS RATIO | .209 |

SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| BROKEN BOW-COLUMBUS | 12.3 | .38 |
| COLUMBUS-OMAHA | 16.9 | .53 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 302: DENVER-SIDNEY-OGALLALA

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| DENVER-SIDNEY | 6.8 | 156 | 26.00 |
| SIDNEY-OGALLALA | .0 | 63 | .00 |
| DENVER-OGALLALA | 9.9 | | 29.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| DENVER-SIDNEY | 16.7 | .52 |
| SIDNEY-OGALLALA | 9.9 | .31 |

### ROUTE DATA

| | |
|---|---|
| __ANNUAL__ | |
| REVENUE (000) | 156.8 |
| OPER. COST(000) | 221.5 |
| PROFIT/LOSS(000) | -64.7 |
| __BLOCK TIME__(DAILY HR) | 4.8 |
| __FREQUENCY__(DAY) | 2 |
| __AIRCRAFT SIZE__ | 8 |
| __NO. OF AIRCRAFT__(3) | .70 |
| __AVG LOAD FACTOR__ | .45 |
| __LOSS RATIO__ | .413 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

ROUTE 303: CASPER-WORLAND-JODY

ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| CASPER-WORLAND | 17.4 | 122 | 25.00 |
| WORLAND-JODY | .0 | 80 | .00 |
| CASPER-JODY | 15.1 | | 32.00 |

SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| CASPER-WORLAND | 32.5 | .54 |
| WORLAND-JODY | 15.1 | .25 |

ROUTE DATA

| ANNUAL | |
|---|---|
| REVENUE (000) | 310.3 |
| OPER. COST(000) | 395.3 |
| PROFIT/LOSS(000) | ⁻85.0 |
| BLOCK TIME(DAILY HR) | 4.0 |
| FREQUENCY(DAY) | 2 |
| AIRCRAFT SIZE | 15 |
| NO OF AIRCRAFT(3) | .58 |
| AVG LOAD FACTOR | .43 |
| B/E RATIO | .2[illegible]4 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR. [illegible]

## ROUTE 304: BILLINGS-BUTTE-DILLON

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| BILLINGS-BUTTE | 14.0 | 191 | 35.00 |
| BUTTE-DILLON | 1.1 | 48 | 19.00 |
| BILLINGS-DILLON | 6.6 | | 32.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| BILLINGS-BUTTE | 20.6 | .64 |
| BUTTE-DILLON | 7.7 | .24 |

### ROUTE DATA

| | |
|---|---|
| ANNUAL | |
| REVENUE (000) | 244.1 |
| OPER. COST(000) | 255.7 |
| PROFIT/LOSS(000) | -11.7 |
| BLOCK TIME(DAILY HR) | 5.6 |
| FREQUENCY(DAY) | 2 |
| AIRCRAFT SIZE | 8 |
| NO OF AIRCRAFT(3) | .81 |
| AVG LOAD FACTOR | .56 |
| LOSS RATIO | .048 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

ROUTE 005: BILLINGS- MILES CITY-GLENDIVE

ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (ST. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| BILLINGS-MILES CITY | 9.4 | 134 | 20.00 |
| MILES CITY-GLENDIVE | .6 | 75 | [illegible] |
| BILLINGS-GLENDIVE | .8 | | 30.00 |

SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| BILLINGS-MILES CITY | 10.2 | .51 |
| MILES CITY-GLENDIVE | [illegible] | .27 |

ROUTE DATA

| ANNUAL | |
|---|---|
| REVENUE (000) | 146.8 |
| OPER. COST(000) | 230.2 |
| PROFIT/LOSS(000) | -83.4 |
| BLOCK TIME (DAILY HR.) | 5.1 |
| FREQUENCY(DAY) | 2 |
| AIRCRAFT SIZE | 8 |
| NO OF AIRCRAFT(3) | .74 |
| AVE LOAD FACTOR | .42 |
| LOSS RATIO | .568 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 306: BILLINGS-SIDNEY-WILLISTON

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| BILLINGS-SIDNEY | 9.3 | 265 | 35.00 |
| SIDNEY-WILLISTON | .0 | 41 | .00 |
| BILLINGS-WILLISTON | 7.6 | | 36.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| BILLINGS-SIDNEY | 16.9 | .53 |
| SIDNEY-WILLISTON | 7.6 | .24 |

### ROUTE DATA

| | |
|---|---|
| ANNUAL | |
| REVENUE (000) | 202.5 |
| OPER. COST(000) | 298.6 |
| PROFIT/LOSS(000) | -96.1 |
| BLOCK TIME(DAILY HR.) | 6.9 |
| FREQUENCY(DAY) | 2 |
| AIRCRAFT SIZE | 8 |
| NO OF AIRCRAFT(3) | 1.01 |
| AVG LOAD FACTOR | .49 |
| LOSS RATIO | .474 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 307: BILLINGS-GLASGOW-WOLF PT.

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| BILLINGS-GLASGOW | 10.8 | 188 | 31.00 |
| GLASGOW-WOLF PT. | .0 | 49 | .00 |
| BILLINGS-WOLF PT. | 6.8 | | 36.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| BILLINGS-GLASGOW | 17.6 | .55 |
| GLASGOW-WOLF PT. | 6.8 | .21 |

### ROUTE DATA

| ANNUAL | |
|---|---|
| REVENUE (000) | 195.9 |
| OPER. COST(000) | 249.7 |
| PROFIT/LOSS(000) | -53.8 |
| BLOCK TIME(DAILY HR) | 5.5 |
| FREQUENCY(RT) | 2 |
| AIRCRAFT SIZE | 8 |
| NO OF AIRCRAFT(3) | .81 |
| AVG LOAD FACTOR | .48 |
| LOSS RATIO | .275 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 308: CASPER-RAWLINS-SARATOGA

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| CASPER-RAWLINS | 16.1 | 97 | 21.00 |
| RAWLINS-SARATOGA | .0 | 26 | .00 |
| CASPER-SARATOGA | 2.8 |  | 22.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| CASPER-RAWLINS | 18.9 | .59 |
| RAWLINS-SARATOGA | 2.8 | .09 |

### ROUTE DATA

| ANNUAL |  |
|---|---|
| REVENUE (000) | 135.1 |
| OPER. COST(000) | 169.4 |
| PROFIT/LOSS(000) | -34.3 |
| BLOCK TIME(DAILY HR) | 3.3 |
| FREQUENCY(DAY) | 2 |
| AIRCRAFT SIZE | 8 |
| NO OF AIRCRAFT(3) | .49 |
| AVG LOAD FACTOR | .48 |
| LOSS RATIO | .254 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

```
                                                          FINAL     NETWORK- SEPT. 22 1975

                        ROUTE 309: KEMMERER-EVANSTON-SALT LAKE


                 ORIGIN AND DESTINATION                              ROUTE DATA

                               2-WAY    DISTANCE   ONE-WAY    ANNUAL
          CITY PAIR         DAILY PASS.  (S. MI.)   FARE
                                (1)        (2)                  REVENUE (000)       150.8

  KEMMERER-EVANSTON              .0        65         .00        OPER. COST(000)     167.1

  EVANSTON-SALT LAKE           13.7        55       22.00        PROFIT/LOSS(000)    -16.3

  KEMMERER-SALT LAKE            5.8                 25.00     BLOCK TIME(DAILY HR)     3.5

                                                              FREQUENCY(DAY)           2
                      SEGMENT DATA
                                                              AIRCRAFT SIZE            8

          SEGMENT            ON-BOARD PASS.   LOAD FACTOR     NO OF AIRCRAFT(3)      .48

                                                              AVG LOAD FACTOR        .38
  KEMMERER-EVANSTON               5.8             .16
                                                              LOSS RATIO            .108
  EVANSTON-SALT LAKE             19.5             .61


    (1) ON THIS ROUTE
    (2) AIRWAY DISTANCE
    (3) BASED ON 2500 HR YEARLY
```

# ROUTE 310: BISMARCK-MINOT-STANLEY

## ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| BISMARCK-MINOT | 16.5 | 106 | 22.00 |
| MINOT-STANLEY | 6.7 | 49 | 17.00 |
| BISMARCK-STANLEY | 1.6 |  | 27.00 |

## SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| BISMARCK-MINOT | 18.1 | .57 |
| MINOT-STANLEY | 8.3 | .26 |

## ROUTE DATA

| | |
|---|---|
| ANNUAL | |
| REVENUE (000) | 175.8 |
| OPER. COST(000) | 197.3 |
| PROFIT/LOSS(000) | -21.5 |
| BLOCK TIME(DAILY HR) | 3.9 |
| FREQUENCY(DAY) | 2 |
| AIRCRAFT SIZE | 8 |
| NO OF AIRCRAFT(3) | .58 |
| AVG LOAD FACTOR | .47 |
| LOSS RATIO | .122 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 311: SIOUX FALLS-MITCHELL-WINNER

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| SIOUX FALLS-MITCHELL | 14.4 | 58 | 20.00 |
| MITCHELL-WINNER | 2.3 | 92 | 25.00 |
| SIOUX FALLS-WINNER | 6.7 | | 28.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| SIOUX FALLS-MITCHELL | 21.1 | .66 |
| MITCHELL-WINNER | 9.0 | .28 |

### ROUTE DATA

| ANNUAL | |
|---|---|
| REVENUE (000) | 178.6 |
| OPER. COST (000) | 192.2 |
| PROFIT/LOSS (000) | -13.6 |
| BLOCK TIME (DAILY HR) | 3.9 |
| FREQUENCY (RT) | 2 |
| AIRCRAFT SIZE | 8 |
| NO OF AIRCRAFT (3) | .56 |
| AVG LOAD FACTOR | .43 |
| LOSS RATIO | .076 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

ROUTE 312: BISMARCK-DEVILS LAKE-GRAND FORKS

ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| BISMARCK-DEVILS LAKE | 9.2 | 130 | 26.00 |
| DEVILS LAKE-GRAND FORKS | 13.1 | 80 | 20.00 |
| BISMARCK-GRAND FORKS | 18.0 | | 29.00 |

SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| BISMARCK-DEVILS LAKE | 27.2 | .45 |
| DEVILS LAKE-GRAND FORKS | 31.1 | .52 |

ROUTE DATA

| ANNUAL | |
|---|---|
| REVENUE (000) | 345.8 |
| OPER. COST(000) | 413.7 |
| PROFIT/LOSS(000) | -67.9 |
| BLOCK TIME(DAILY HR) | 4.1 |
| FREQUENCY(DAY) | 2 |
| AIRCRAFT SIZE | 15 |
| NO OF AIRCRAFT(3) | .60 |
| AVG LOAD FACTOR | .46 |
| LOSS RATIO | .196 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

ROUTE 318: DENVER-LARAMIE-SARATOGA

ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| DENVER-LARAMIE | 17.3 | 115 | 28.00 |
| LARAMIE-SARATOGA | .0 | 59 | .00 |
| DENVER-SARATOGA | 1.0 | | 29.00 |

SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| DENVER-LARAMIE | 18.3 | .57 |
| LARAMIE-SARATOGA | 1.0 | .03 |

ROUTE DATA

| ANNUAL | |
|---|---|
| REVENUE (000) | 173.5 |
| OPER. COST(000) | 204.5 |
| PROFIT/LOSS(000) | ¯31.0 |
| BLOCK TIME(DAILY HR) | 4.3 |
| FREQUENCY(DAY) | 2 |
| AIRCRAFT SIZE | 8 |
| NO OF AIRCRAFT(3) | .63 |
| AVG LOAD FACTOR | .39 |
| LOSS RATIO | .178 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 314: MC COOK-KEARNEY-OMAHA

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| MC COOK-KEARNEY | .0 | 55 | .00 |
| KEARNEY-OMAHA | 13.6 | 167 | 29.00 |
| MC COOK-OMAHA | 5.2 | | 35.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| MC COOK-KEARNEY | 5.2 | .16 |
| KEARNEY-OMAHA | 18.8 | .59 |

### ROUTE DATA

| | |
|---|---|
| ANNUAL | |
| REVENUE (000) | 194.8 |
| OPER. COST(000) | 240.1 |
| PROFIT/LOSS(000) | $^-$45.3 |
| BLOCK TIME(DAILY HR.) | 5.3 |
| FREQUENCY(DAY) | 2 |
| AIRCRAFT SIZE | 8 |
| NO OF AIRCRAFT(3) | .77 |
| AVG LOAD FACTOR | .48 |
| LOSS RATIO | .232 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 315: HOLDREGE-HASTINGS-OMAHA

ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| HOLDREGE-HASTINGS | .0 | 61 | .00 |
| HASTINGS-OMAHA | 10.0 | 141 | 30.00 |
| HOLDREGE-OMAHA | 9.9 | | 35.00 |

SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| HOLDREGE-HASTINGS | 9.9 | .31 |
| HASTINGS-OMAHA | 19.9 | .62 |

ROUTE DATA

| | |
|---|---|
| ANNUAL | |
| REVENUE (000) | 218.5 |
| OPER. COST(000) | 227.2 |
| PROFIT/LOSS(000) | -8.7 |
| BLOCK TIME(DAILY HR) | 4.9 |
| FREQUENCY(R.T) | 2 |
| AIRCRAFT SIZE | 8 |
| NO OF AIRCRAFT(3) | .71 |
| AVG LOAD FACTOR | .53 |
| LOSS RATIO | .040 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

# ROUTE 316: FAIRBURY-LINCOLN-OMAHA

## ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| FAIRBURY-LINCOLN | 4.7 | 55 | 20.00 |
| LINCOLN-OMAHA | .0 | 55 | .00 |
| FAIRBURY-OMAHA | 12.3 | | 24.00 |

## SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| FAIRBURY-LINCOLN | 17.0 | .53 |
| LINCOLN-OMAHA | 12.3 | .38 |

## ROUTE DATA

| | |
|---|---|
| ANNUAL | |
| REVENUE (000) | 131.5 |
| OPER. COST(000) | 158.3 |
| PROFIT/LOSS(000) | -26.8 |
| BLOCK TIME(DAILY HR) | 3.1 |
| FREQUENCY(DAY) | 2 |
| AIRCRAFT SIZE | 8 |
| NO OF AIRCRAFT(3) | .45 |
| AVG LOAD FACTOR | .46 |
| LOSS RATIO | .204 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

```
                  ROUTE 317: RAPID CITY-GILLETTE-SHERIDAN


         ORIGIN AND DESTINATION                               ROUTE DATA

                              2-WAY    DISTANCE   ONE-WAY    ANNUAL
          CITY PAIR       DAILY PASS.  (S. MI.)    FARE
                              (1)        (2)                   REVENUE (000)          190.0

RAPID CITY-GILLETTE           6.9        120       50.00       OPER. COST(000)        223.2

GILLETTE-SHERIDAN              .0         82         .00       PROFIT/LOSS(000)       -33.2

RAPID CITY-SHERIDAN           9.6                  57.00     BLOCK TIME(DAILY HR)       4.9

                                                             FREQUENCY(DAY)               2
                     SEGMENT DATA
                                                             AIRCRAFT SIZE                8

          SEGMENT            ON-BOARD PASS.   LOAD FACTOR    NO OF AIRCRAFT(3)          .71

                                                             AVG LOAD FACTOR            .43

RAPID CITY-GILLETTE              16.5            .52         LOSS RATIO                .175

GILLETTE-SHERIDAN                 9.6            .30


      (1) ON THIS ROUTE
      (2) AIRWAY DISTANCE
      (3) BASED ON 2500 HR YEARLY
```

## ROUTE 318: RAPID CITY-PINERIDGE-CHADRON-SCOTTSBLUFF

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS.$^{(1)}$ | DISTANCE$^{(2)}$ (S. MI.') | ONE-WAY FARE |
|---|---|---|---|
| RAPID CITY-PINERIDGE | 7.6 | 74 | 21.00 |
| PINERIDGE-CHADRON | .0 | 31 | .00 |
| CHADRON-SCOTTSBLUFF | 8.8 | 68 | 25.00 |
| CHADRON-RAPID CITY | 3.6 | | 22.00 |
| PINERIDGE-SCOTTSBLUFF | 5.1 | | 27.00 |
| RAPID CITY-SCOTTSBLUFF | 4.5 | | 31.00 |

### ROUTE DATA

| | |
|---|---|
| ANNUAL | |
| REVENUE (000) | 248.8 |
| OPER. COST (000) | 247.0 |
| PROFIT/LOSS (000) | 1.7 |
| BLOCK TIME (DAILY HR) | 4.8 |
| FREQUENCY (DRT) | 2 |
| AIRCRAFT SIZE | 8 |
| NO. OF AIRCRAFT$^{(3)}$ | .69 |
| AVG. LOAD FACTOR | .51 |
| LOSS RATIO | - |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| RAPID CITY-PINERIDGE | 15.7 | .49 |
| PINERIDGE-CHADRON | 13.2 | .41 |
| CHADRON-SCOTTSBLUFF | 18.4 | .58 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 319: OMAHA-NORFOLK-O'NEILL-AINSWORTH-VALENTINE FINAL NETWORK

### Origin and Destination

| City-Pair | Two-Way Daily Pass.[1] | Distance (smi)[2] | One-Way Fare |
|---|---|---|---|
| Omaha-Norfolk | 3.0 | 102 | 24 |
| Omaha-O'Neill | 9.9 | - | 30 |
| Omaha-Ainsworth | 3.5 | - | 36 |
| Omaha-Valentine | 4.0 | - | 38 |
| Norfolk-O'Neill | 2.0 | 70 | 21 |
| Norfolk-Ainsworth | 0.6 | - | 27 |
| Norfolk-Valentine | 0 | - | - |
| Ainsworth-O'Neill | - | 67 | - |
| Ainsworth-Valentine | - | 37 | - |

### Route Data

Annual

Revenue (000): 238.4
Oper. Cost (000): 347.3
Profit/Loss (000): -108.9
Block Time (Daily Hr.): 7.24
Frequency (DRT): 2
Aircraft Size: 8
No. of Aircraft[3]: 1.06
Ave. Load Factor: 47%
Loss Ratio: .46

### Segment Data

| Segment | On-Board Pass. | Load Factor |
|---|---|---|
| Omaha-Norfolk | 20.4 | 64% |
| Norfolk-O'Neill | 20.0 | 63% |
| O'Neill-Ainsworth | 8.1 | 25% |
| Ainsworth-Valentine | 4.0 | 13% |

[1] On this route

[2] Airway distance

[3] Based on 2500 hours yearly

- ROUTE ANALYSIS OUTPUT
  (Non-Stop Routes)
- ROUTE ANALYSIS OUTPUT
  (Multi-Stop Routes)

# OLD WEST ROUTE ANALYSIS OUTPUT FORMAT DESCRIPTION

## ( NON-STOP ROUTES )

| Route Name | Route No. | Revenue (000) | Cost (000) | P/L $(000) | Loss Ratio | A/C Ratio | Freq. DRT | No. A/C | PLF | Pass/ Day | Fare |
|---|---|---|---|---|---|---|---|---|---|---|---|

Revenue = Annual route revenue in dollars

Cost = Route annual direct and indirect operating cost (including a 12.35% average annual return on investment in dollars)

P/L = Annual route profit or loss

Loss Ratio = Loss (required subsidy) divided by revenue

A/C Cap = Aircraft passenger capacity

Freq (DRT) = Service frequency in daily round trips

No. A/C = Fraction of aircraft required on route at 2500 hours annual utilization

PLF = Passenger load factor (average of total route)

Pass/Day = Number of two way daily passengers between communites

Fare = One-way fare related to noted passenger demand

## FINAL NETWORK WITH BREAKEVEN ROI

| ROUTE (CITY-PAIR) | RT. NO. | DIST | REVENUE (000) | COST (000) | P/L (000) | LOSS RATIO | A/C CAP | FREQ DRT | NO. A/C | PLF | PASS/ DAY | FARE (OW) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ABERDEEN-BISMARCK | 224 | 148 | 139.2 | 150.3 | ¯11.1 | .08 | 8 | 2 | .49 | .56 | 17.9 | 23 |
| ABERDEEN-SIOUX FALLS | 228 | 145 | 490.8 | 390.3 | 100.5 |  | 15 | 3 | .58 | .54 | 48.4 | 30 |
| ALLIANCE-SCOTTSBLUFF | 234 | 37 | 56.2 | 68.5 | ¯12.2 | .22 | 8 | 2 | .17 | .40 | 12.8 | 13 |
| BILLINGS-BUTTE | 212 | 126 | 622.2 | 358.6 | 263.6 |  | 15 | 3 | .52 | .58 | 52.6 | 35 |
| BILLINGS-LEWISTOWN | 215 | 101 | 55.2 | 109.1 | ¯53.9 | .98 | 8 | 2 | .35 | .30 | 9.6 | 17 |
| BILLINGS-SHERIDAN | 213 | 101 | 81.1 | 111.6 | ¯30.5 | .38 | 8 | 2 | .35 | .38 | 12.0 | 20 |
| BISMARCK-DICKINSON | 204 | 100 | 71.8 | 111.4 | ¯39.6 | .55 | 8 | 2 | .35 | .39 | 12.5 | 17 |
| BISMARCK-PIERRE | 209 | 266 | 134.9 | 226.3 | ¯91.4 | .68 | 8 | 2 | .82 | .42 | 13.3 | 30 |
| BISMARCK-WILLISTON | 222 | 193 | 139.9 | 181.7 | ¯41.7 | .30 | 8 | 2 | .62 | .56 | 18.0 | 23 |
| BROKEN BOW-N. PLATTE | 237 | 65 | 62.4 | 87.2 | ¯24.8 | .40 | 8 | 2 | .25 | .38 | 12.3 | 15 |
| BROOKINGS-SIOUX FALLS | 206 | 50 | 85.7 | 81.3 | 4.4 |  | 8 | 2 | .21 | .53 | 16.9 | 15 |
| BUTTE-MISSOULA | 214 | 107 | 828.6 | 540.5 | 288.1 |  | 15 | 5 | .76 | .61 | 90.8 | 27 |
| CASPER-GILLETTE | 217 | 103 | 112.0 | 120.7 | ¯8.7 | .08 | 8 | 2 | .36 | .61 | 19.5 | 17 |
| CASPER-RIVERTON | 210 | 101 | 446.4 | 309.1 | 137.4 |  | 15 | 3 | .44 | .56 | 50.8 | 26 |
| CASPER-ROCK SPRINGS | 219 | 160 | 77.4 | 150.8 | ¯73.4 | .95 | 8 | 2 | .52 | .34 | 10.9 | 21 |
| CASPER-SHERIDAN | 205 | 131 | 958.2 | 736.2 | 222.0 |  | 15 | 6 | 1.07 | .58 | 105.0 | 27 |
| CHEYENNE-TORRINGTON | 207 | 69 | 36.5 | 85.0 | ¯48.4 | 1.33 | 8 | 2 | .26 | .22 | 7.2 | 15 |
| CHEYENNE-WHEATLAND | 208 | 58 | 29.8 | 76.6 | ¯46.8 | 1.57 | 8 | 2 | .23 | .20 | 6.3 | 14 |
| DENVER-LARAMIE | 221 | 115 | 94.6 | 64.8 | 29.8 |  | 8 | 1 | .20 | .63 | 10.0 | 28 |
| DENVER-MC COOK | 238 | 224 | 160.2 | 200.5 | ¯40.3 | .25 | 8 | 2 | .70 | .49 | 15.8 | 30 |
| FARGO-GRAND FORKS | 223 | 75 | 138.7 | 98.8 | 39.9 |  | 8 | 2 | .28 | .53 | 17.1 | 24 |
| FARGO-JAMESTOWN | 225 | 87 | 85.6 | 104.9 | ¯19.3 | .23 | 8 | 2 | .32 | .47 | 14.9 | 17 |
| GREAT FALLS-HAVRE | 201 | 107 | 46.5 | 111.6 | ¯65.1 | 1.40 | 8 | 2 | .37 | .25 | 8.1 | 17 |
| GREAT FALLS-KALISPELL | 202 | 139 | 163.1 | 245.1 | ¯82.0 | .50 | 15 | 2 | .37 | .42 | 25.4 | 19 |
| GREAT FALLS-SHELBY | 211 | 89 | 55.7 | 101.6 | ¯45.9 | .82 | 8 | 2 | .32 | .32 | 10.3 | 16 |
| HASTINGS-OMAHA | 218 | 141 | 203.0 | 145.8 | 57.2 |  | 8 | 2 | .47 | .57 | 18.2 | 33 |
| HURON-SIOUX FALLS | 229 | 79 | 153.2 | 105.1 | 48.1 |  | 8 | 2 | .29 | .64 | 20.6 | 22 |
| KALISPELL-SPOKANE | 203 | 167 | 1372.5 | 882.5 | 490.0 |  | 15 | 6 | 1.31 | .63 | 112.8 | 36 |
| LINCOLN-PIERRE | 216 | 351 | 194.7 | 286.3 | ¯91.6 | .47 | 8 | 2 | 1.06 | .45 | 14.4 | 40 |
| ~~MINNEAPOLIS-WATERTOWN~~ | ~~220~~ | ~~193~~ | ~~520.6~~ | ~~470.8~~ | ~~49.8~~ |  | ~~15~~ | ~~3~~ | ~~.74~~ | ~~.51~~ | ~~46.0~~ | ~~34~~ |
| NORFOLK-OMAHA | 239 | 102 | 331.0 | 241.9 | 89.1 |  | 8 | 4 | .72 | .64 | 40.8 | 24 |
| SIOUX FALLS-WATERTOWN | 230 | 78 | 108.9 | 101.7 | 7.2 |  | 8 | 2 | .29 | .56 | 17.9 | 18 |
| SIOUX FALLS-YANKTON | 231 | 48 | 102.3 | 80.7 | 21.5 |  | 8 | 2 | .20 | .56 | 17.8 | 17 |
| ZERO-A | 227 | 101 | 26.0 | 92.0 | ¯66.0 | 2.54 | 5 | 2 | .34 | .16 | 3.2 | 24 |
| ZERO-B | 232 | 75 | 29.1 | 78.0 | ¯48.9 | 1.68 | 5 | 2 | .27 | .20 | 4.1 | 21 |
| ZERO-C | 233 | 68 | 12.8 | 71.8 | ¯59.0 | 4.62 | 5 | 2 | .25 | .09 | 1.8 | 21 |
| ZERO-D | 236 | 63 | 25.0 | 70.7 | ¯45.7 | 1.83 | 5 | 2 | .24 | .18 | 3.7 | 20 |
| ZERO-E | 226 | 134 | 63.2 | 117.1 | ¯53.9 | .85 | 5 | 2 | .44 | .44 | 8.9 | 21 |
| ZERO-F | 235 | 61 | 72.3 | 76.4 | ¯4.0 | .06 | 5 | 2 | .24 | .53 | 10.7 | 20 |

# OLD WEST ROUTE ANALYSIS OUTPUT FORMAT DESCRIPTION
# (MULTI-STOP ROUTES)

The multi-stop computer outputs are designed to provide visibility into the key characteristics of each route segment. It includes an origin and destination section identifying the city-pairs involved in the route, the two-way daily air passengers between each city-pair, the airway distance in statute miles for each segment, and a one-way fare in dollars. In some cases, a community is involved in more than one route (e.g. Norfolk, Nebraska, to Omaha). The total demand from Norfolk to Omaha is thus the sum of the non-stop route demand plus the Norfolk-Omaha segment demand of the multi-stop route.

The segment data section describes each flight segment in terms of on-board passengers and each segment's load factor.

The route data section summarizes, on a route basis, the annual revenue, direct and indirect operating costs, and resultant profit or loss. It also includes the number of hours per day the aircraft is operating (block time), the number of daily round trips, the recommended aircraft size, the number of aircraft required for the route based upon a desired 2500 hours yearly utilization, the average route load factor, and, where routes are unprofitable, a subsidy or loss ratio (loss or required subsidy divided by the revenue).

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                          ROUTE 301: BROKEN BOW-COLUMBUS-OMAHA


                  ORIGIN AND DESTINATION                            ROUTE DATA


                               2-WAY   DISTANCE   ONE-WAY    ANNUAL
          CITY PAIR         DAILY PASS. (S. MI.)   FARE
                                (1)       (2)                  REVENUE (000)        179.7

BROKEN BOW-COLUMBUS              .0       112       .00        OPER. COST(000)      211.5

COLUMBUS-OMAHA                  4.6        81     22.00        PROFIT/LOSS(000)     ¯31.8

BROKEN BOW-OMAHA               12.3               35.00      BLOCK_TIME(DAILY HR)     4.7

                                                             FREQUENCY(DRT)             2
                      SEGMENT DATA
                                                             AIRCRAFT_SIZE              8

          SEGMENT              ON-BOARD PASS.   LOAD FACTOR  NO_OF_AIRCRAFT(3)        .68

                                                             AVG_LOAD_FACTOR          .44
BROKEN BOW-COLUMBUS                 12.3            .38
                                                             LOSS_RATIO              .177
COLUMBUS-OMAHA                      16.9            .53


    (1) ON THIS ROUTE
    (2) AIRWAY DISTANCE
    (3) BASED ON 2500 HR YEARLY
```

## ROUTE 302: DENVER-SIDNEY-OGALLALA

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| DENVER-SIDNEY | 6.8 | 136 | 26.00 |
| SIDNEY-OGALLALA | .0 | 63 | .00 |
| DENVER-OGALLALA | 9.9 | | 29.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| DENVER-SIDNEY | 16.7 | .52 |
| SIDNEY-OGALLALA | 9.9 | .31 |

### ROUTE DATA

| | |
|---|---|
| ANNUAL | |
| REVENUE (000) | 156.8 |
| OPER. COST(000) | 215.6 |
| PROFIT/LOSS(000) | ¯58.8 |
| BLOCK_TIME(DAILY HR) | 4.8 |
| FREQUENCY(DRT) | 2 |
| AIRCRAFT_SIZE | 8 |
| NO_OF_AIRCRAFT(3) | .70 |
| AVG_LOAD_FACTOR | .45 |
| LOSS_RATIO | .375 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 303: CASPER-WORLAND-CODY

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| CASPER-WORLAND | 17.4 | 122 | 25.00 |
| WORLAND-CODY | .0 | 80 | .00 |
| CASPER-CODY | 15.1 |  | 32.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| CASPER-WORLAND | 32.5 | .54 |
| WORLAND-CODY | 15.1 | .25 |

### ROUTE DATA

| ANNUAL |  |
|---|---|
| REVENUE (000) | 310.3 |
| OPER. COST(000) | 378.8 |
| PROFIT/LOSS(000) | -68.4 |
| BLOCK_TIME(DAILY HR) | 4.0 |
| FREQUENCY(DRT) | 2 |
| AIRCRAFT_SIZE | 15 |
| NO_OF_AIRCRAFT(3) | .58 |
| AVG_LOAD_FACTOR | .43 |
| LOSS_RATIO | .221 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 304: BILLINGS-BUTTE-DILLON

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| BILLINGS-BUTTE | 14.0 | 191 | 35.00 |
| BUTTE-DILLON | 1.1 | 48 | 19.00 |
| BILLINGS-DILLON | 6.6 | | 32.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| BILLINGS-BUTTE | 20.6 | .64 |
| BUTTE-DILLON | 7.7 | .24 |

### ROUTE DATA

| | |
|---|---|
| ANNUAL | |
| REVENUE (000) | 244.1 |
| OPER. COST(000) | 248.8 |
| PROFIT/LOSS(000) | ¯4.7 |
| BLOCK_TIME(DAILY HR) | 5.6 |
| FREQUENCY(DRT) | 2 |
| AIRCRAFT_SIZE | 8 |
| NO_OF_AIRCRAFT(3) | .81 |
| AVG_LOAD_FACTOR | .56 |
| LOSS_RATIO | .019 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 305: BILLINGS-MILES CITY-GLENDIVE

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| BILLINGS-MILES CITY | 7.4 | 134 | 23.00 |
| MILES CITY-GLENDIVE | .0 | 75 | .00 |
| BILLINGS-GLENDIVE | 8.8 | | 30.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| BILLINGS-MILES CITY | 16.2 | .51 |
| MILES CITY-GLENDIVE | 8.8 | .27 |

### ROUTE DATA

| | |
|---|---|
| ANNUAL | |
| REVENUE (000) | 146.8 |
| OPER. COST(000) | 223.9 |
| PROFIT/LOSS(000) | ¯77.1 |
| BLOCK_TIME(DAILY HR) | 5.1 |
| FREQUENCY(DRT) | 2 |
| AIRCRAFT_SIZE | 8 |
| NO_OF_AIRCRAFT(3) | .74 |
| AVG_LOAD_FACTOR | .42 |
| LOSS_RATIO | .525 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 306: BILLINGS-SIDNEY-WILLISTON

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| BILLINGS-SIDNEY | 9.3 | 265 | 35.00 |
| SIDNEY-WILLISTON | .0 | 41 | .00 |
| BILLINGS-WILLISTON | 7.6 | | 36.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| BILLINGS-SIDNEY | 16.9 | .53 |
| SIDNEY-WILLISTON | 7.6 | .24 |

### ROUTE DATA

| ANNUAL | |
|---|---|
| REVENUE (000) | 202.5 |
| OPER. COST(000) | 290.0 |
| PROFIT/LOSS(000) | ¯87.5 |
| BLOCK_TIME(DAILY HR) | 6.9 |
| FREQUENCY(DRT) | 2 |
| AIRCRAFT_SIZE | 8 |
| NO_OF_AIRCRAFT(3) | 1.01 |
| AVG_LOAD_FACTOR | .49 |
| LOSS_RATIO | .432 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

ROUTE 307: BILLINGS-GLASGOW-WOLF PT.

ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| BILLINGS-GLASGOW | 10.8 | 188 | 31.00 |
| GLASGOW-WOLF PT. | .0 | 49 | .00 |
| BILLINGS-WOLF PT. | 6.8 | | 36.00 |

SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| BILLINGS-GLASGOW | 17.6 | .55 |
| GLASGOW-WOLF PT. | 6.8 | .21 |

ROUTE DATA

| ANNUAL | |
|---|---|
| REVENUE (000) | 195.9 |
| OPER. COST(000) | 242.8 |
| PROFIT/LOSS(000) | ¯46.9 |
| BLOCK_TIME(DAILY HR) | 5.5 |
| FREQUENCY(DRT) | 2 |
| AIRCRAFT_SIZE | 8 |
| NO_OF_AIRCRAFT(3) | .81 |
| AVG_LOAD_FACTOR | .48 |
| LOSS_RATIO | .240 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 308: CASPER-RAWLINS-SARATOGA

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| CASPER-RAWLINS | 16.1 | 97 | 21.00 |
| RAWLINS-SARATOGA | .0 | 26 | .00 |
| CASPER-SARATOGA | 2.8 | | 22.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| CASPER-RAWLINS | 18.9 | .59 |
| RAWLINS-SARATOGA | 2.8 | .09 |

### ROUTE DATA

| | |
|---|---|
| ANNUAL | |
| REVENUE (000) | 135.1 |
| OPER. COST(000) | 165.3 |
| PROFIT/LOSS(000) | ⁻30.2 |
| BLOCK_TIME(DAILY HR) | 3.3 |
| FREQUENCY(DRT) | 2 |
| AIRCRAFT_SIZE | 8 |
| NO_OF_AIRCRAFT(3) | .49 |
| AVG_LOAD_FACTOR | .48 |
| LOSS_RATIO | .223 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

### ROUTE 309: KEMMERER-EVANSTON-SALT LAKE

#### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| KEMMERER-EVANSTON | .0 | 65 | .00 |
| EVANSTON-SALT LAKE | 13.7 | 55 | 22.00 |
| KEMMERER-SALT LAKE | 5.8 | | 25.00 |

#### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| KEMMERER-EVANSTON | 5.8 | .18 |
| EVANSTON-SALT LAKE | 19.5 | .61 |

#### ROUTE DATA

| | |
|---|---|
| ANNUAL | |
| REVENUE (000) | 150.9 |
| OPER. COST(000) | 163.1 |
| PROFIT/LOSS(000) | ¯12.2 |
| BLOCK_TIME(DAILY HR) | 3.3 |
| FREQUENCY(DRT) | 2 |
| AIRCRAFT_SIZE | 8 |
| NO_OF_AIRCRAFT(3) | .48 |
| AVG_LOAD_FACTOR | .38 |
| LOSS_RATIO | .081 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 310: BISMARCK-MINOT-STANLEY

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| BISMARCK-MINOT | 16.5 | 106 | 22.00 |
| MINOT-STANLEY | 6.7 | 49 | 17.00 |
| BISMARCK-STANLEY | 1.6 | | 27.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| BISMARCK-MINOT | 18.1 | .57 |
| MINOT-STANLEY | 8.3 | .26 |

### ROUTE DATA

| | |
|---|---|
| ANNUAL | |
| REVENUE (000) | 175.8 |
| OPER. COST(000) | 192.4 |
| PROFIT/LOSS(000) | ¯16.6 |
| BLOCK_TIME(DAILY HR) | 3.9 |
| FREQUENCY(DRT) | 2 |
| AIRCRAFT_SIZE | 8 |
| NO_OF_AIRCRAFT(3) | .58 |
| AVG_LOAD_FACTOR | .47 |
| LOSS_RATIO | .094 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 311: SIOUX FALLS-MITCHELL-WINNER

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| SIOUX FALLS-MITCHELL | 14.4 | 58 | 20.00 |
| MITCHELL-WINNER | 2.3 | 92 | 23.00 |
| SIOUX FALLS-WINNER | 6.7 | | 28.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| SIOUX FALLS-MITCHELL | 21.1 | .66 |
| MITCHELL-WINNER | 9.0 | .28 |

### ROUTE DATA

| ANNUAL | |
|---|---|
| REVENUE (000) | 178.6 |
| OPER. COST(000) | 187.4 |
| PROFIT/LOSS(000) | ¯8.8 |
| BLOCK_TIME(DAILY HR) | 3.9 |
| FREQUENCY(DRT) | 2 |
| AIRCRAFT_SIZE | 8 |
| NO_OF_AIRCRAFT(3) | .56 |
| AVG_LOAD_FACTOR | .43 |
| LOSS_RATIO | .049 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 312: BISMARCK-DEVILS LAKE-GRAND FORKS

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| BISMARCK-DEVILS LAKE | 9.2 | 130 | 26.00 |
| DEVILS LAKE-GRAND FORKS | 13.1 | 80 | 20.00 |
| BISMARCK-GRAND FORKS | 18.0 | | 29.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| BISMARCK-DEVILS LAKE | 27.2 | .45 |
| DEVILS LAKE-GRAND FORKS | 31.1 | .52 |

### ROUTE DATA

| | |
|---|---|
| ANNUAL | |
| REVENUE (000) | 345.8 |
| OPER. COST(000) | 396.7 |
| PROFIT/LOSS(000) | -50.8 |
| BLOCK_TIME(DAILY HR) | 4.1 |
| FREQUENCY(DRT) | 2 |
| AIRCRAFT_SIZE | 15 |
| NO_OF_AIRCRAFT(3) | .60 |
| AVG_LOAD_FACTOR | .48 |
| LOSS_RATIO | .147 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

```
                      ROUTE 313: DENVER-LARAMIE-SARATOGA


             ORIGIN AND DESTINATION                             ROUTE DATA


                                 2-WAY   DISTANCE  ONE-WAY   ANNUAL
        CITY PAIR             DAILY PASS. (S. MI.)   FARE
                                  (1)       (2)                REVENUE (000)        173.5

DENVER-LARAMIE                   17.3       115     28.00      OPER. COST(000)      199.1

LARAMIE-SARATOGA                   .0        59       .00      PROFIT/LOSS(000)     ¯25.6

DENVER-SARATOGA                   1.0               29.00    BLOCK_TIME(DAILY HR)     4.3

                                                             FREQUENCY(DRT)             2
                     SEGMENT DATA
                                                             AIRCRAFT_SIZE              8

          SEGMENT            ON-BOARD PASS.   LOAD FACTOR    NO_OF_AIRCRAFT(3)        .63

                                                             AVG_LOAD_FACTOR          .39
DENVER-LARAMIE                     18.3           .57
                                                             LOSS_RATIO              .148
LARAMIE-SARATOGA                    1.0           .03


  (1) ON THIS ROUTE
  (2) AIRWAY DISTANCE
  (3) BASED ON 2500 HR YEARLY
```

## ROUTE 314: MC COOK-KEARNEY-OMAHA

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| MC COOK-KEARNEY | .0 | 55 | .00 |
| KEARNEY-OMAHA | 13.6 | 167 | 29.00 |
| MC COOK-OMAHA | 5.2 |  | 35.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| MC COOK-KEARNEY | 5.2 | .16 |
| KEARNEY-OMAHA | 18.8 | .59 |

### ROUTE DATA

| ANNUAL |  |
|---|---|
| REVENUE (000) | 194.8 |
| OPER. COST(000) | 233.6 |
| PROFIT/LOSS(000) | ¯38.7 |
| BLOCK_TIME(DAILY HR) | 5.3 |
| FREQUENCY(DRT) | 2 |
| AIRCRAFT_SIZE | 8 |
| NO_OF_AIRCRAFT(3) | .77 |
| AVG_LOAD_FACTOR | .48 |
| LOSS_RATIO | .199 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

```
                    ROUTE 315: HOLDREGE-HASTINGS-OMAHA


          ORIGIN AND DESTINATION                          ROUTE DATA

                              2-WAY   DISTANCE  ONE-WAY  ANNUAL
        CITY PAIR          DAILY PASS. (S. MI.)   FARE
                               (1)       (2)               REVENUE (000)       218.5

HOLDREGE-HASTINGS              .0        61        .00     OPER. COST(000)     221.2

HASTINGS-OMAHA               10.0       141      30.00     PROFIT/LOSS(000)    -2.7

HOLDREGE-OMAHA                9.9                35.00   BLOCK_TIME(DAILY HR)   4.9

                                                         FREQUENCY(DRT)           2
                     SEGMENT DATA
                                                         AIRCRAFT_SIZE            8

          SEGMENT          ON-BOARD PASS.   LOAD FACTOR  NO_OF_AIRCRAFT(3)      .71

                                                         AVG_LOAD_FACTOR        .53
HOLDREGE-HASTINGS               9.9            .31
                                                         LOSS_RATIO            .012
HASTINGS-OMAHA                 19.9            .62


  (1) ON THIS ROUTE
  (2) AIRWAY DISTANCE
  (3) BASED ON 2500 HR YEARLY
```

## ROUTE 316: FAIRBURY-LINCOLN-OMAHA

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| FAIRBURY-LINCOLN | 4.7 | 55 | 20.00 |
| LINCOLN-OMAHA | .0 | 55 | .00 |
| FAIRBURY-OMAHA | 12.3 | | 24.00 |

### ROUTE DATA

| | |
|---|---|
| ANNUAL | |
| REVENUE (000) | 131.5 |
| OPER. COST(000) | 154.5 |
| PROFIT/LOSS(000) | ¯23.0 |
| BLOCK_TIME(DAILY HR) | 3.1 |
| FREQUENCY(DRT) | 2 |
| AIRCRAFT_SIZE | 8 |
| NO_OF_AIRCRAFT(3) | .45 |
| AVG_LOAD_FACTOR | .46 |
| LOSS_RATIO | .175 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| FAIRBURY-LINCOLN | 17.0 | .53 |
| LINCOLN-OMAHA | 12.3 | .38 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 317: RAPID CITY-GILLETTE-SHERIDAN

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| RAPID CITY-GILLETTE | 6.9 | 120 | 30.00 |
| GILLETTE-SHERIDAN | .0 | 82 | .00 |
| RAPID CITY-SHERIDAN | 9.6 | | 37.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| RAPID CITY-GILLETTE | 16.5 | .52 |
| GILLETTE-SHERIDAN | 9.6 | .30 |

### ROUTE DATA

| | |
|---|---|
| ANNUAL | |
| REVENUE (000) | 190.0 |
| OPER. COST(000) | 217.2 |
| PROFIT/LOSS(000) | ¯27.2 |
| BLOCK_TIME(DAILY HR) | 4.9 |
| FREQUENCY(DRT) | 2 |
| AIRCRAFT_SIZE | 8 |
| NO_OF_AIRCRAFT(3) | .71 |
| AVG_LOAD_FACTOR | .43 |
| LOSS_RATIO | .143 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 318: RAPID CITY-PINERIDGE-CHADRON-SCOTTSBLUFF

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS.(1) | DISTANCE(2) (S. MI.) | ONE-WAY FARE |
|---|---|---|---|
| RAPID CITY-PINERIDGE | 7.6 | 74 | 21.00 |
| PINERIDGE-CHADRON | .0 | 31 | .00 |
| CHADRON-SCOTTSBLUFF | 8.8 | 68 | 25.00 |
| CHADRON-RAPID CITY | 3.6 | | 22.00 |
| PINERIDGE-SCOTTSBLUFF | 5.1 | | 27.00 |
| RAPID CITY-SCOTTSBLUFF | 4.5 | | 31.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| RAPID CITY-PINERIDGE | 15.7 | .49 |
| PINERIDGE-CHADRON | 13.2 | .41 |
| CHADRON-SCOTTSBLUFF | 18.4 | .58 |

### ROUTE DATA

| | |
|---|---|
| ANNUAL | |
| REVENUE (000) | 248.8 |
| OPER. COST (000) | 241.1 |
| PROFIT/LOSS (000) | 7.7 |
| BLOCK TIME (DAILY HR) | 4.8 |
| FREQUENCY (DRT) | 2 |
| AIRCRAFT SIZE | 8 |
| NO. OF AIRCRAFT(3) | .69 |
| AVG. LOAD FACTOR | .51 |
| LOSS RATIO | - |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 319: OMAHA-NORFOLK-O'NEILL-AINSWORTH-VALENTINE
## FINAL NETWORK WITH BREAKEVEN ROI

### Origin and Destination

| City-Pair | Two-Way Daily Pass.[1] | Distance (smi)[2] | One-Way Fare |
|---|---|---|---|
| Omaha-Norfolk | 3.0 | 102 | 24 |
| Omaha-O'Neill | 9.9 | - | 30 |
| Omaha-Ainsworth | 3.5 | - | 36 |
| Omaha-Valentine | 4.0 | - | 38 |
| Norfolk-O'Neill | 2.0 | 70 | 21 |
| Norfolk-Ainsworth | 0.6 | - | 27 |
| Norfolk-Valentine | 0 | - | - |
| Ainsworth-O'Neill | - | 67 | - |
| Ainsworth-Valentine | - | 37 | - |

### Route Data

Annual

Revenue (000): 238.4
Oper. Cost (000): 338.3
Profit/Loss (000): -99.9
Block Time (Daily Hr.): 7.24
Frequency (DRT): 2
Aircraft Size: 8
No. of Aircraft[3]: 1.06
Ave. Load Factor: 47%
Loss Ratio: .42

### Segment Data

| Segment | On-Board Pass. | Load Factor |
|---|---|---|
| Omaha-Norfolk | 20.4 | 64% |
| Norfolk-O'Neill | 20.0 | 63% |
| O'Neill-Ainsworth | 8.1 | 25% |
| Ainsworth-Valentine | 4.0 | 13% |

[1] On this route

[2] Airway distance

[3] Based on 2500 hours yearly

- ROUTE ANALYSIS OUTPUT
  (Non-Stop Routes)
- ROUTE ANALYSIS OUTPUT
  (Multi-Stop Routes)

## OLD WEST ROUTE ANALYSIS OUTPUT FORMAT DESCRIPTION

### ( NON-STOP ROUTES )

| Route Name | Route No. | Revenue (000) | Cost (000) | P/L $(000) | Loss Ratio | A/C Ratio | Freq. DRT | No. A/C | PLF | Pass/ Day | Fare |
|---|---|---|---|---|---|---|---|---|---|---|---|

Revenue = Annual route revenue in dollars

Cost = Route annual direct and indirect operating cost (including a 12.35% average annual return on investment in dollars)

P/L = Annual route profit or loss

Loss Ratio = Loss (required subsidy) divided by revenue

A/C Cap = Aircraft passenger capacity

Freq (DRT) = Service frequency in daily round trips

No. A/C = Fraction of aircraft required on route at 2500 hours annual utilization

PLF = Passenger load factor (average of total route)

Pass/Day = Number of two way daily passengers between communites

Fare = One-way fare related to noted passenger demand

## DEMAND BUILDUP ANALYSIS

| ROUTE (CITY-PAIR) | RT. NO. | DIST | REVENUE (000) | COST (000) | P/L (000) | LOSS RATIO | A/C CAP | FREQ DRT | NO. A/C | PLF | PASS/ DAY | FARE (OW) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ABERDEEN-BISMARCK | 224 | 148 | 104.4 | 145.3 | -41.0 | .39 | 8 | 2 | .49 | .42 | 13.4 | 23 |
| ABERDEEN-SIOUX FALLS | 228 | 145 | 291.1 | 259.8 | 31.3 | | 15 | 2 | .39 | .53 | 31.9 | 27 |
| ALLIANCE-SCOTTSBLUFF | 234 | 37 | 42.2 | 65.5 | -23.3 | .55 | 8 | 2 | .17 | .30 | 9.6 | 13 |
| BILLINGS-BUTTE | 212 | 126 | 311.2 | 233.4 | 77.8 | | 15 | 2 | .35 | .49 | 29.7 | 31 |
| BILLINGS-LEWISTOWN | 215 | 101 | 41.4 | 106.6 | -65.3 | 1.58 | 8 | 2 | .35 | .22 | 7.2 | 17 |
| BILLINGS-SHERIDAN | 213 | 101 | 60.8 | 108.5 | -47.6 | .78 | 8 | 2 | .35 | .28 | 9.0 | 20 |
| BISMARCK-DICKINSON | 204 | 100 | 53.9 | 108.2 | -54.3 | 1.01 | 8 | 2 | .35 | .29 | 9.4 | 17 |
| BISMARCK-PIERRE | 209 | 266 | 101.1 | 222.0 | -120.8 | 1.19 | 8 | 2 | .82 | .31 | 10.0 | 30 |
| BISMARCK-WILLISTON | 222 | 193 | 104.9 | 176.4 | -71.4 | .68 | 8 | 2 | .62 | .42 | 13.5 | 23 |
| BROKEN BOW-N. PLATTE | 237 | 65 | 46.8 | 84.2 | -37.4 | .80 | 8 | 2 | .25 | .29 | 9.2 | 15 |
| BROOKINGS-SIOUX FALLS | 206 | 50 | 64.3 | 77.3 | -13.0 | .20 | 8 | 2 | .21 | .40 | 12.7 | 15 |
| BUTTE-MISSOULA | 214 | 107 | 441.3 | 324.2 | 117.0 | | 15 | 3 | .45 | .60 | 54.4 | 24 |
| CASPER-GILLETTE | 217 | 103 | 84.0 | 115.7 | -31.6 | .38 | 8 | 2 | .36 | .46 | 14.6 | 17 |
| CASPER-RIVERTON | 210 | 101 | 259.6 | 204.1 | 55.5 | | 15 | 2 | .29 | .53 | 32.0 | 24 |
| CASPER-ROCK SPRINGS | 219 | 160 | 58.0 | 147.7 | -89.7 | 1.55 | 8 | 2 | .52 | .26 | 8.2 | 21 |
| CASPER-SHERIDAN | 205 | 131 | 709.8 | 613.5 | 96.3 | | 15 | 5 | .89 | .58 | 87.5 | 24 |
| CHEYENNE-TORRINGTON | 207 | 69 | 27.4 | 83.2 | -55.8 | 2.04 | 8 | 2 | .26 | .17 | 5.4 | 15 |
| CHEYENNE-WHEATLAND | 208 | 58 | 22.4 | 75.1 | -52.8 | 2.36 | 8 | 2 | .23 | .15 | 4.7 | 14 |
| DENVER-LARAMIE | 221 | 115 | 71.0 | 62.2 | 8.8 | | 8 | 1 | .20 | .47 | 7.5 | 28 |
| DENVER-MC COOK | 238 | 224 | 120.2 | 195.7 | -75.5 | .63 | 8 | 2 | .70 | .37 | 11.8 | 30 |
| FARGO-GRAND FORKS | 223 | 75 | 104.0 | 94.6 | 9.5 | | 8 | 2 | .28 | .40 | 12.8 | 24 |
| FARGO-JAMESTOWN | 225 | 87 | 64.2 | 101.2 | -36.9 | .58 | 8 | 2 | .32 | .35 | 11.2 | 17 |
| GREAT FALLS-HAVRE | 201 | 107 | 34.9 | 109.5 | -74.6 | 2.14 | 8 | 2 | .37 | .19 | 6.1 | 17 |
| GREAT FALLS-KALISPELL | 202 | 139 | 122.3 | 238.2 | -115.8 | .95 | 15 | 2 | .37 | .32 | 19.0 | 19 |
| GREAT FALLS-SHELBY | 211 | 89 | 41.8 | 99.0 | -57.3 | 1.37 | 8 | 2 | .32 | .24 | 7.7 | 16 |
| HASTINGS-OMAHA | 218 | 141 | 152.2 | 140.8 | 11.5 | | 8 | 2 | .47 | .43 | 13.6 | 33 |
| HURON-SIOUX FALLS | 229 | 79 | 114.9 | 99.9 | 14.9 | | 8 | 2 | .29 | .48 | 15.5 | 22 |
| KALISPELL-SPOKANE | 203 | 167 | 985.3 | 732.1 | 253.2 | | 15 | 5 | 1.09 | .61 | 91.1 | 32 |
| LINCOLN-PIERRE | 216 | 351 | 146.0 | 281.1 | -135.1 | .93 | 8 | 2 | 1.06 | .34 | 10.8 | 40 |
| ~~MINNEAPOLIS-WATERTOWN~~ | ~~220~~ | ~~193~~ | ~~310.1~~ | ~~317.9~~ | ~~-7.8~~ | ~~.03~~ | ~~15~~ | ~~2~~ | ~~.49~~ | ~~.49~~ | ~~29.6~~ | ~~31~~ |
| NORFOLK-OMAHA | 239 | 102 | 146.9 | 119.4 | 27.5 | | 8 | 2 | .36 | .59 | 18.9 | 23 |
| SIOUX FALLS-WATERTOWN | 230 | 78 | 81.7 | 97.2 | -15.6 | .19 | 8 | 2 | .29 | .42 | 13.4 | 18 |
| SIOUX FALLS-YANKTON | 231 | 48 | 76.7 | 76.5 | .2 | | 8 | 2 | .20 | .42 | 13.4 | 17 |
| ZERO-A | 227 | 101 | 19.5 | 91.2 | -71.7 | 3.68 | 5 | 2 | .34 | .12 | 2.4 | 24 |
| ZERO-B | 232 | 75 | 21.8 | 77.0 | -55.2 | 2.53 | 5 | 2 | .27 | .15 | 3.1 | 21 |
| ZERO-C | 233 | 68 | 9.6 | 71.3 | -61.7 | 6.44 | 5 | 2 | .25 | .07 | 1.3 | 21 |
| ZERO-D | 236 | 63 | 18.8 | 69.8 | -51.1 | 2.72 | 5 | 2 | .24 | .14 | 2.8 | 20 |
| ZERO-E | 226 | 134 | 47.4 | 114.6 | -67.3 | 1.42 | 5 | 2 | .44 | .33 | 6.7 | 21 |
| ZERO-F | 235 | 61 | 54.2 | 73.8 | -19.5 | .36 | 5 | 2 | .24 | .40 | 8.0 | 20 |

## OLD WEST ROUTE ANALYSIS OUTPUT FORMAT DESCRIPTION

## (MULTI-STOP ROUTES)

The multi-stop computer outputs are designed to provide visibility into the key characteristics of each route segment. It includes an origin and destination section identifying the city-pairs involved in the route, the two-way daily air passengers between each city-pair, the airway distance in statute miles for each segment, and a one-way fare in dollars. In some cases, a community is involved in more than one route (e. g. Norfolk, Nebraska, to Omaha). The total demand from Norfolk to Omaha is thus the sum of the non-stop route demand plus the Norfolk-Omaha segment demand of the multi-stop route.

The segment data section describes each flight segment in terms of on-board passengers and each segment's load factor.

The route data section summarizes, on a route basis, the annual revenue, direct and indirect operating costs, and resultant profit or loss. It also includes the number of hours per day the aircraft is operating (block time), the number of daily round trips, the recommended aircraft size, the number of aircraft required for the route based upon a desired 2500 hours yearly utilization, the average route load factor, and, where routes are unprofitable, a subsidy or loss ratio (loss or required subsidy divided by the revenue).

## ROUTE 301: BROKEN BOW-COLUMBUS-OMAHA

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| BROKEN BOW-COLUMBUS | .0 | 112 | .00 |
| COLUMBUS-OMAHA | 3.4 | 81 | 22.00 |
| BROKEN BOW-OMAHA | 9.2 | | 35.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| BROKEN BOW-COLUMBUS | 9.2 | .29 |
| COLUMBUS-OMAHA | 12.7 | .40 |

### ROUTE DATA

| | |
|---|---|
| ANNUAL | |
| REVENUE (000) | 134.8 |
| OPER. COST(000) | 206.7 |
| PROFIT/LOSS(000) | ¯72.0 |
| BLOCK_TIME(DAILY HR) | 4.7 |
| FREQUENCY(DRT) | 2 |
| AIRCRAFT_SIZE | 8 |
| NO_OF_AIRCRAFT(3) | .68 |
| AVG_LOAD_FACTOR | .33 |
| LOSS_RATIO | .534 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 302: DENVER-SIDNEY-OGALLALA

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| DENVER-SIDNEY | 5.1 | 136 | 26.00 |
| SIDNEY-OGALLALA | .0 | 63 | .00 |
| DENVER-OGALLALA | 7.4 | | 29.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| DENVER-SIDNEY | 12.5 | .39 |
| SIDNEY-OGALLALA | 7.4 | .23 |

### ROUTE DATA

| | |
|---|---|
| ANNUAL | |
| REVENUE (000) | 117.6 |
| OPER. COST(000) | 210.8 |
| PROFIT/LOSS(000) | ¯93.2 |
| BLOCK_TIME(DAILY HR) | 4.8 |
| FREQUENCY(DRT) | 2 |
| AIRCRAFT_SIZE | 8 |
| NO_OF_AIRCRAFT(3) | .70 |
| AVG_LOAD_FACTOR | .34 |
| LOSS_RATIO | .792 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

```
                      ROUTE 303: CASPER-WORLAND-CODY


              ORIGIN AND DESTINATION                         ROUTE DATA

                             2-WAY   DISTANCE   ONE-WAY    ANNUAL
          CITY PAIR       DAILY PASS. (S. MI.)   FARE
                              (1)       (2)                  REVENUE (000)       232.8

CASPER-WORLAND               13.0       122      25.00       OPER. COST(000)     369.7

WORLAND-CODY                   .0        80        .00       PROFIT/LOSS(000)   ¯136.9

CASPER-CODY                  11.3                32.00     BLOCK_TIME(DAILY HR)    4.0

                                                           FREQUENCY(DRT)            2
                 SEGMENT DATA
                                                           AIRCRAFT_SIZE            15

           SEGMENT           ON-BOARD PASS.   LOAD FACTOR  NO_OF_AIRCRAFT(3)       .58

                                                           AVG_LOAD_FACTOR         .32
CASPER-WORLAND                   24.4           .41
                                                           LOSS_RATIO             .588
WORLAND-CODY                     11.3           .19


    (1) ON THIS ROUTE
    (2) AIRWAY DISTANCE
    (3) BASED ON 2500 HR YEARLY
```

## ROUTE 304: BILLINGS-BUTTE-DILLON

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| BILLINGS-BUTTE | 10.5 | 191 | 35.00 |
| BUTTE-DILLON | .8 | 48 | 19.00 |
| BILLINGS-DILLON | 4.9 | | 32.00 |

### ROUTE DATA

| ANNUAL | |
|---|---|
| REVENUE (000) | 183.0 |
| OPER. COST(000) | 242.4 |
| PROFIT/LOSS(000) | ¯59.3 |
| BLOCK_TIME(DAILY HR) | 5.6 |
| FREQUENCY(DRT) | 2 |
| AIRCRAFT_SIZE | 8 |
| NO_OF_AIRCRAFT(3) | .81 |
| AVG_LOAD_FACTOR | .42 |
| LOSS_RATIO | .324 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| BILLINGS-BUTTE | 15.4 | .48 |
| BUTTE-DILLON | 5.8 | .18 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 305: BILLINGS-MILES CITY-GLENDIVE

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| BILLINGS-MILES CITY | 5.5 | 134 | 23.00 |
| MILES CITY-GLENDIVE | .0 | 75 | .00 |
| BILLINGS-GLENDIVE | 6.6 | | 30.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| BILLINGS-MILES CITY | 12.1 | .38 |
| MILES CITY-GLENDIVE | 6.6 | .21 |

### ROUTE DATA

| | |
|---|---|
| ANNUAL | |
| REVENUE (000) | 110.1 |
| OPER. COST(000) | 219.2 |
| PROFIT/LOSS(000) | ¯109.1 |
| BLOCK_TIME(DAILY HR) | 5.1 |
| FREQUENCY(DRT) | 2 |
| AIRCRAFT_SIZE | 8 |
| NO_OF_AIRCRAFT(3) | .74 |
| AVG_LOAD_FACTOR | .32 |
| LOSS_RATIO | .992 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 306: BILLINGS-SIDNEY-WILLISTON

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| BILLINGS-SIDNEY | 7.0 | 265 | 35.00 |
| SIDNEY-WILLISTON | .0 | 41 | .00 |
| BILLINGS-WILLISTON | 5.7 | | 36.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| BILLINGS-SIDNEY | 12.7 | .40 |
| SIDNEY-WILLISTON | 5.7 | .18 |

### ROUTE DATA

| | |
|---|---|
| ANNUAL | |
| REVENUE (000) | 151.9 |
| OPER. COST(000) | 284.4 |
| PROFIT/LOSS(000) | -132.6 |
| BLOCK_TIME(DAILY HR) | 6.9 |
| FREQUENCY(DRT) | 2 |
| AIRCRAFT_SIZE | 8 |
| NO_OF_AIRCRAFT(3) | 1.01 |
| AVG_LOAD_FACTOR | .37 |
| LOSS_RATIO | .873 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 307: BILLINGS-GLASGOW-WOLF PT.

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| BILLINGS-GLASGOW | 8.1 | 188 | 31.00 |
| GLASGOW-WOLF PT. | .0 | 49 | .00 |
| BILLINGS-WOLF PT. | 5.1 | | 36.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| BILLINGS-GLASGOW | 13.2 | .41 |
| GLASGOW-WOLF PT. | 5.1 | .16 |

### ROUTE DATA

| | |
|---|---|
| ANNUAL | |
| REVENUE (000) | 146.9 |
| OPER. COST(000) | 237.6 |
| PROFIT/LOSS(000) | -90.6 |
| BLOCK_TIME(DAILY HR) | 5.5 |
| FREQUENCY(DRT) | 2 |
| AIRCRAFT_SIZE | 8 |
| NO_OF_AIRCRAFT(3) | .81 |
| AVG_LOAD_FACTOR | .36 |
| LOSS_RATIO | .617 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 308: CASPER-RAWLINS-SARATOGA

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| CASPER-RAWLINS | 12.1 | 97 | 21.00 |
| RAWLINS-SARATOGA | .0 | 26 | .00 |
| CASPER-SARATOGA | 2.1 |  | 22.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| CASPER-RAWLINS | 14.2 | .44 |
| RAWLINS-SARATOGA | 2.1 | .07 |

### ROUTE DATA

| ANNUAL |  |
|---|---|
| REVENUE (000) | 101.3 |
| OPER. COST(000) | 160.4 |
| PROFIT/LOSS(000) | ¯59.1 |
| BLOCK_TIME(DAILY HR) | 3.3 |
| FREQUENCY(DRT) | 2 |
| AIRCRAFT_SIZE | 8 |
| NO_OF_AIRCRAFT(3) | .49 |
| AVG_LOAD_FACTOR | .36 |
| LOSS_RATIO | .583 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 309: KEMMERER-EVANSTON-SALT LAKE

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| KEMMERER-EVANSTON | .0 | 65 | .00 |
| EVANSTON-SALT LAKE | 10.3 | 55 | 22.00 |
| KEMMERER-SALT LAKE | 4.3 | | 25.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| KEMMERER-EVANSTON | 4.3 | .14 |
| EVANSTON-SALT LAKE | 14.6 | .46 |

### ROUTE DATA

| | |
|---|---|
| ANNUAL | |
| REVENUE (000) | 113.2 |
| OPER. COST(000) | 158.3 |
| PROFIT/LOSS(000) | ¯45.1 |
| BLOCK_TIME(DAILY HR) | 3.3 |
| FREQUENCY(DRT) | 2 |
| AIRCRAFT_SIZE | 8 |
| NO_OF_AIRCRAFT(3) | .48 |
| AVG_LOAD_FACTOR | .28 |
| LOSS_RATIO | .399 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 310: BISMARCK-MINOT-STANLEY

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| BISMARCK-MINOT | 12.4 | 106 | 22.00 |
| MINOT-STANLEY | 5.0 | 49 | 17.00 |
| BISMARCK-STANLEY | 1.2 | | 27.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| BISMARCK-MINOT | 13.6 | .42 |
| MINOT-STANLEY | 6.2 | .19 |

### ROUTE DATA

| ANNUAL | |
|---|---|
| REVENUE (000) | 131.8 |
| OPER. COST(000) | 186.1 |
| PROFIT/LOSS(000) | -54.2 |
| BLOCK_TIME(DAILY HR) | 3.9 |
| FREQUENCY(DRT) | 2 |
| AIRCRAFT_SIZE | 8 |
| NO_OF_AIRCRAFT(3) | .58 |
| AVG_LOAD_FACTOR | .35 |
| LOSS_RATIO | .411 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 311: SIOUX FALLS-MITCHELL-WINNER

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| SIOUX FALLS-MITCHELL | 10.8 | 58 | 20.00 |
| MITCHELL-WINNER | 1.7 | 92 | 23.00 |
| SIOUX FALLS-WINNER | 5.0 | | 28.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| SIOUX FALLS-MITCHELL | 15.8 | .49 |
| MITCHELL-WINNER | 6.7 | .21 |

### ROUTE DATA

| | |
|---|---|
| ANNUAL | |
| REVENUE (000) | 134.0 |
| OPER. COST(000) | 181.5 |
| PROFIT/LOSS(000) | ¯47.5 |
| BLOCK_TIME(DAILY HR) | 3.9 |
| FREQUENCY(DRT) | 2 |
| AIRCRAFT_SIZE | 8 |
| NO_OF_AIRCRAFT(3) | .56 |
| AVG_LOAD_FACTOR | .32 |
| LOSS_RATIO | .355 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 312: BISMARCK-DEVILS LAKE-GRAND FORKS

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| BISMARCK-DEVILS LAKE | 6.9 | 130 | 26.00 |
| DEVILS LAKE-GRAND FORKS | 9.8 | 80 | 20.00 |
| BISMARCK-GRAND FORKS | 13.5 | | 29.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| BISMARCK-DEVILS LAKE | 20.4 | .34 |
| DEVILS LAKE-GRAND FORKS | 23.3 | .39 |

### ROUTE DATA

| | |
|---|---|
| ANNUAL | |
| REVENUE (000) | 259.4 |
| OPER. COST(000) | 385.5 |
| PROFIT/LOSS(000) | -126.1 |
| BLOCK_TIME(DAILY HR) | 4.1 |
| FREQUENCY(DRT) | 2 |
| AIRCRAFT_SIZE | 15 |
| NO_OF_AIRCRAFT(3) | .60 |
| AVG_LOAD_FACTOR | .36 |
| LOSS_RATIO | .486 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 313: DENVER-LARAMIE-SARATOGA

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| DENVER-LARAMIE | 13.0 | 115 | 28.00 |
| LARAMIE-SARATOGA | .0 | 59 | .00 |
| DENVER-SARATOGA | .8 | | 29.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| DENVER-LARAMIE | 13.7 | .43 |
| LARAMIE-SARATOGA | .8 | .02 |

### ROUTE DATA

| | |
|---|---|
| ANNUAL | |
| REVENUE (000) | 130.1 |
| OPER. COST(000) | 194.3 |
| PROFIT/LOSS(000) | ¯64.2 |
| BLOCK_TIME(DAILY HR) | 4.3 |
| FREQUENCY(DRT) | 2 |
| AIRCRAFT_SIZE | 8 |
| NO_OF_AIRCRAFT(3) | .63 |
| AVG_LOAD_FACTOR | .29 |
| LOSS_RATIO | .493 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 314: MC COOK-KEARNEY-OMAHA

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| MC COOK-KEARNEY | .0 | 55 | .00 |
| KEARNEY-OMAHA | 10.2 | 167 | 29.00 |
| MC COOK-OMAHA | 3.9 | | 35.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| MC COOK-KEARNEY | 3.9 | .12 |
| KEARNEY-OMAHA | 14.1 | .44 |

### ROUTE DATA

| | |
|---|---|
| ANNUAL | |
| REVENUE (000) | 146.1 |
| OPER. COST(000) | 228.1 |
| PROFIT/LOSS(000) | -82.0 |
| BLOCK_TIME(DAILY HR) | 5.3 |
| FREQUENCY(DRT) | 2 |
| AIRCRAFT_SIZE | 8 |
| NO_OF_AIRCRAFT(3) | .77 |
| AVG_LOAD_FACTOR | .36 |
| LOSS_RATIO | .561 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 315: HOLDREGE-HASTINGS-OMAHA

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| HOLDREGE-HASTINGS | .0 | 61 | .00 |
| HASTINGS-OMAHA | 7.5 | 141 | 30.00 |
| HOLDREGE-OMAHA | 7.4 | | 35.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| HOLDREGE-HASTINGS | 7.4 | .23 |
| HASTINGS-OMAHA | 14.9 | .47 |

### ROUTE DATA

| ANNUAL | |
|---|---|
| REVENUE (000) | 163.9 |
| OPER. COST(000) | 215.5 |
| PROFIT/LOSS(000) | ¯51.6 |
| BLOCK_TIME(DAILY HR) | 4.9 |
| FREQUENCY(DRT) | 2 |
| AIRCRAFT_SIZE | 8 |
| NO_OF_AIRCRAFT(3) | .71 |
| AVG_LOAD_FACTOR | .40 |
| LOSS_RATIO | .315 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 316: FAIRBURY-LINCOLN-OMAHA

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| FAIRBURY-LINCOLN | 3.5 | 55 | 20.00 |
| LINCOLN-OMAHA | .0 | 55 | .00 |
| FAIRBURY-OMAHA | 9.2 | | 24.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| FAIRBURY-LINCOLN | 12.7 | .40 |
| LINCOLN-OMAHA | 9.2 | .29 |

### ROUTE DATA

| ANNUAL | |
|---|---|
| REVENUE (000) | 98.7 |
| OPER. COST(000) | 150.2 |
| PROFIT/LOSS(000) | -51.5 |
| BLOCK_TIME(DAILY HR) | 3.1 |
| FREQUENCY(DRT) | 2 |
| AIRCRAFT_SIZE | 8 |
| NO_OF_AIRCRAFT(3) | .45 |
| AVG_LOAD_FACTOR | .34 |
| LOSS_RATIO | .522 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 317: RAPID CITY-GILLETTE-SHERIDAN

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS. (1) | DISTANCE (S. MI.) (2) | ONE-WAY FARE |
|---|---|---|---|
| RAPID CITY-GILLETTE | 5.2 | 120 | 30.00 |
| GILLETTE-SHERIDAN | .0 | 82 | .00 |
| RAPID CITY-SHERIDAN | 7.2 | | 37.00 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| RAPID CITY-GILLETTE | 12.4 | .39 |
| GILLETTE-SHERIDAN | 7.2 | .22 |

### ROUTE DATA

| | |
|---|---|
| ANNUAL | |
| REVENUE (000) | 142.5 |
| OPER. COST(000) | 212.5 |
| PROFIT/LOSS(000) | ¯70.0 |
| BLOCK_TIME(DAILY HR) | 4.9 |
| FREQUENCY(DRT) | 2 |
| AIRCRAFT_SIZE | 8 |
| NO_OF_AIRCRAFT(3) | .71 |
| AVG_LOAD_FACTOR | .32 |
| LOSS_RATIO | .491 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 318: RAPID CITY-PINERIDGE-CHADRON-SCOTTSBLUFF

### ORIGIN AND DESTINATION

| CITY PAIR | 2-WAY DAILY PASS.(1) | DISTANCE(2) (S. MI.) | ONE-WAY FARE |
|---|---|---|---|
| RAPID CITY-PINERIDGE | 5.7 | 74 | 21.00 |
| PINERIDGE-CHADRON | .0 | 31 | .00 |
| CHADRON-SCOTTSBLUFF | 6.6 | 68 | 25.00 |
| CHADRON-RAPID CITY | 2.7 | | 22.00 |
| PINERIDGE-SCOTTSBLUFF | 3.8 | | 27.00 |
| RAPID CITY-SCOTTSBLUFF | 3.4 | | 31.00 |

### ROUTE DATA

| | |
|---|---|
| ANNUAL | |
| REVENUE (000) | 186.6 |
| OPER. COST (000) | 233.6 |
| PROFIT/LOSS (000) | -47.0 |
| BLOCK TIME (DAILY HR) | 4.8 |
| FREQUENCY (DRT) | 2 |
| AIRCRAFT SIZE | 8 |
| NO. OF AIRCRAFT(3) | .69 |
| AVG. LOAD FACTOR | .38 |
| LOSS RATIO | .25 |

### SEGMENT DATA

| SEGMENT | ON-BOARD PASS. | LOAD FACTOR |
|---|---|---|
| RAPID CITY-PINERIDGE | 11.8 | .37 |
| PINERIDGE-CHADRON | 9.9 | .31 |
| CHADRON-SCOTTSBLUFF | 13.8 | .44 |

(1) ON THIS ROUTE
(2) AIRWAY DISTANCE
(3) BASED ON 2500 HR YEARLY

## ROUTE 319: OMAHA-NORFOLK-O'NEILL-AINSWORTH-VALENTINE
## DEMAND BUILD-UP ANALYSIS

### Origin and Destination

| City-Pair | Two-Way Daily Pass.[1] | Distance (smi)[2] | One-Way Fare |
|---|---|---|---|
| Omaha-Norfolk | 2.2 | 102 | 24 |
| Omaha-O'Neill | 7.4 | - | 30 |
| Omaha-Ainsworth | 2.6 | - | 36 |
| Omaha-Valentine | 3.0 | - | 38 |
| Norfolk-O'Neill | 1.5 | 70 | 21 |
| Norfolk-Ainsworth | 0.40 | - | 27 |
| Norfolk-Valentine | 0 | - | - |
| Ainsworth-O'Neill | - | 67 | - |
| Ainsworth-Valentine | - | 37 | - |

### Route Data

Annual

Revenue (000): 178.8
Oper. Cost (000): 332.1
Profit/Loss (000): -153.3
Block Time (Daily Hr.): 7.24
Frequency (DRT): 2
Aircraft Size: 8
No. of Aircraft[3]: 1.06
Ave. Load Factor: 35%
Loss Ratio: .86

### Segment Data

| Segment | On-Board Pass. | Load Factor |
|---|---|---|
| Omaha-Norfolk | 15.3 | 48% |
| Norfolk-O'Neill | 15.0 | 47% |
| O'Neill-Ainsworth | 6.1 | 19% |
| Ainsworth-Valentine | 3.0 | 9% |

---

[1] On this route

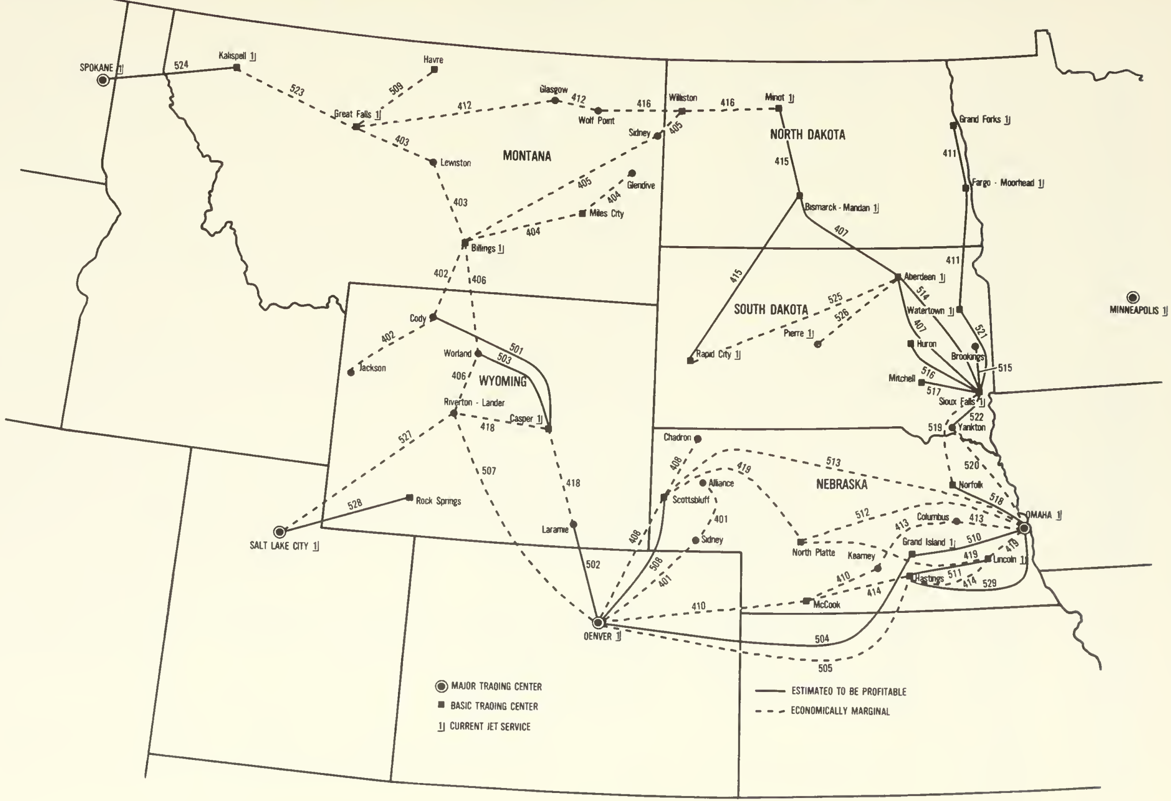
[2] Airway distance

[3] Based on 2500 hours yearly

## APPENDIX 4
## SUBSIDIZED ROUTE REPLACEMENT ANALYSIS

- COMMUTER REPLACEMENT NETWORK (Map)
- NOMINAL DEMAND
- ROUTE ANALYSIS OUTPUT (Non-Stop Routes)
- ROUTE ANALYSIS OUTPUT (One- and Multi-Stop Routes)

# Commuter Replacement Network for Subsidized Local Service Airline Routes



# NOMINAL DEMAND ANALYSIS FORMAT DESCRIPTION

The attached computer run identifies the city-pairs being analyzed in the noted air service concept and includes the following information:

- City Pair. City-pair analyzed.
- Distance. Air distance between city-pair in statute miles.
- 1973 Fare and Demand. Actual fare and local and connecting demand related to 1973 certificated airline service for the noted city-pair.
- 1976 Fare and Demand. Nominal air fare based on current air fares charged in the Old West Region ($15 plus 8.5 cents per mile). Demand columns represent the two-way daily person trips by air forecasted for 1976 commuter service--local O&D as well as connecting passengers (both on-line and inter-line).

## COMMUTER REPLACEMENT NETWORK - FARE AND DEMAND

| CITY PAIR | DIST. (st. mi.) | 1973 ACTUAL FARE ($) | 1973 ACTUAL DEMAND (pass/day) | 1976 NOMINAL FARE ($) | 1976 NOMINAL DEMAND (pass/day) |
|---|---|---|---|---|---|
| Aberdeen-Bismarck | 148 | 25 | 8.7 | 28 | 9.8 |
| Aberdeen - Pierre | 118 | 22 | 3.5 | 25 | 3.7 |
| Aberdeen - Rapid City | 248 | 32 | 17.2 | 36 | 18.0 |
| Aberdeen - Sioux Falls | 145 | 24 | 36.8 | 27 | 42.5 |
| Alliance - Denver | 191 | 32 | 4.7 | 31 | 11.0 |
| Billings - Cody | 84 | 22 | 3.0 | 22 | 3.9 |
| Billings - Glendive | 209 | 32 | 9.7 | 33 | 11.5 |
| Billings - Jackson | 168 | 29 | 8.7 | 29 | 10.2 |
| Billings - Lewiston | 101 | 21 | 3.1 | 24 | 4.6 |
| Billings - Miles City | 134 | 24 | 3.6 | 26 | 5.2 |
| Billings - Riverton | 189 | 34 | 4.8 | 31 | 5.2 |
| Billings - Sidney | 265 | 35 | 4.0 | 38 | 8.3 |
| Billings - Williston | 284 | 38 | 8.7 | 39 | 10.7 |
| Billings - Worland | 130 | 25 | 1.8 | 26 | 1.9 |
| Bismarck - Minot | 106 | 19 | 18.8 | 24 | 12.6 |
| Bismarck - Rapid City | 219 | 30 | 11.6 | 34 | 13.4 |
| Bismarck - Sioux Falls | 293 | 38 | 21.3 | 40 | 20.8 |
| Brookings - Sioux Falls | 50 | 17 | 9.3 | 19 | 9.6 |
| Casper - Cody | 170 | 32 | 19.5 | 29 | 20.2 |
| Casper - Laramie | 117 | 22 | 2.6 | 25 | 5.6 |
| Casper - Riverton | 101 | 22 | 5.9 | 24 | 7.3 |
| Casper - Worland | 122 | 25 | 15.9 | 25 | 17.4 |
| Chadron - Denver | 231 | 36 | 10.0 | 35 | 11.5 |
| Cody - Jackson | 106 | 24 | 2.3 | 24 | 2.6 |
| Columbus - Omaha | 81 | 21 | 4.4 | 22 | 4.6 |
| Denver - Grand Island | 356 | 44 | 40.2 | 45 | 43.5 |
| Denver - Hastings | 346 | 42 | 14.6 | 44 | 15.7 |
| Denver - Kearney | 318 | 40 | 15.7 | 42 | 17.4 |
| Denver - Laramie | 115 | 23 | 39.3 | 25 | 24.3 |
| Denver - North Platte | 240 | 34 | 34.1 | 35 | 36.9 |
| Denver - McCook | 224 | 34 | 10.3 | 34 | 11.0 |
| Denver - Riverton | 294 | 41 | 31.3 | 40 | 24.3 |
| Denver - Scottsbluff | 160 | 27 | 51.9 | 29 | 40.5 |
| Denver - Sidney | 136 | 24 | 5.6 | 27 | 6.0 |

## COMMUTER REPLACEMENT NETWORK - FARE AND DEMAND

| CITY PAIR | DIST. (st. mi.) | 1973 ACTUAL | | 1976 NOMINAL | |
|---|---|---|---|---|---|
| | | FARE ($) | DEMAND (pass/day) | FARE ($) | DEMAND (pass/day) |
| Fargo - Grand Forks | 75 | 16 | 24.4 | 21 | 21.4 |
| Fargo - Watertown | 118 | 25 | 1.5 | 25 | 1.6 |
| Glasgow - Great Falls | 253 | 35 | 6.5 | 36 | 8.5 |
| Grand Forks - Watertown | 210 | 29 | 14.4 | 33 | 15.4 |
| Grand Island - North Platte | 125 | 22 | 0.8 | 26 | 0.8 |
| Grand Island - Omaha | 128 | 24 | 48.7 | 26 | 39.1 |
| Grand Island - Scottsbluff | 282 | 37 | 4.1 | 39 | 1.6 |
| Great Falls - Havre | 107 | 22 | 2.0 | 24 | 3.9 |
| Great Falls - Kalispell | 139 | 24 | 9.2 | 27 | 12.1 |
| Great Falls - Lewiston | 90 | 22 | 1.6 | 23 | 2.8 |
| Great Falls - Wolf Point | 302 | 38 | 5.5 | 41 | 6.6 |
| Hastings - Lincoln | 92 | 21 | 16.0 | 23 | 21.0 |
| Hastings - Omaha | 141 | 26 | 23.4 | 27 | 24.1 |
| Huron - Sioux Falls | 79 | 21 | 20.5 | 22 | 20.6 |
| Kalispell - Spokane | 167 | 25 | 59.4 | 29 | 68.2 |
| Kearney - Omaha | 167 | 28 | 12.8 | 29 | 13.6 |
| Laramie - Riverton | 189 | 32 | 1.8 | 31 | 2.4 |
| Lincoln - North Platte | 207 | 29 | 2.4 | 33 | 4.8 |
| Lincoln - Scottsbluff | 363 | 44 | 8.6 | 46 | 11.5 |
| McCook - Omaha | 232 | 36 | 7.2 | 35 | 7.4 |
| Mitchell - Sioux Falls | 58 | 19 | 14.3 | 20 | 14.4 |
| Minot - Rapid City | 293 | 39 | 10.4 | 40 | 13.3 |
| Minot - Williston | 109 | 23 | 5.7 | 24 | 6.7 |
| Minot - Wolf Point | 198 | 29 | 2.4 | 32 | 3.3 |
| Norfolk - Omaha | 102 | 21 | 19.0 | 24 | 21.8 |
| Norfolk - Sioux Falls | 116 | 22 | 6.0 | 25 | 8.0 |
| North Platte - Omaha | 250 | 35 | 37.2 | 36 | 30.1 |
| North Platte - Scottsbluff | 159 | 26 | 1.5 | 29 | 1.5 |
| Omaha - Scottsbluff | 401 | 49 | 27.8 | 49 | 19.4 |
| Omaha - Yankton | 135 | 25 | 10.2 | 26 | 10.5 |
| Riverton - Rock Springs | 110 | 22 | 0.3 | 24 | 1.4 |
| Riverton - Salt Lake City | 240 | 36 | 9.8 | 35 | 16.4 |
| Riverton - Worland | 68 | 20 | 0.1 | 21 | 0.1 |
| Rock Springs - Salt Lake City | 161 | 27 | 22.2 | 29 | 25.0 |
| Sioux Falls - Watertown | 78 | 21 | 10.2 | 22 | 10.7 |
| Sioux Falls - Yankton | 48 | 17 | 12.6 | 19 | 12.8 |

## OLD WEST ROUTE ANALYSIS OUTPUT FORMAT DESCRIPTION

### ( NON-STOP ROUTES )

| Route Name | Route No. | Revenue (000) | Cost (000) | P/L $(000) | Loss Ratio | A/C Ratio | Freq. DRT | No. A/C | PLF | Pass/ Day | Fare |
|---|---|---|---|---|---|---|---|---|---|---|---|

Revenue = Annual route revenue in dollars

Cost = Route annual direct and indirect operating cost (including a 12. 35% average annual return on investment in dollars)

P/L = Annual route profit or loss

Loss Ratio = Loss (required subsidy) divided by revenue

A/C Cap = Aircraft passenger capacity

Freq (DRT) = Service frequency in daily round trips

No. A/C = Fraction of aircraft required on route at 2500 hours annual utilization

PLF = Passenger load factor (average of total route)

Pass/Day = Number of two way daily passengers between communites

Fare = One-way fare related to noted passenger demand

## NETWORK

| ROUTE (CITY-PAIR) | RT. NO. | DIST | REVENUE (000) | COST (000) | P/L (000) | LOSS RATIO | A/C CAP | FREQ DRT | NO. A/C | PLF | PASS/ DAY | FARE (OW) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ABERDEEN-PIERRE | 526 | 118 | 45.6 | 121.9 | -76.3 | 1.67 | 8 | 2 | .40 | .23 | 7.5 | 18 |
| ABERDEEN-RAPID CITY | 525 | 248 | 191.0 | 223.5 | -32.5 | .17 | 8 | 2 | .77 | .49 | 15.7 | 36 |
| ABERDEEN-SIOUX FALLS | 514 | 145 | 535.4 | 408.0 | 127.3 | | 15 | 3 | .58 | .55 | 49.5 | 32 |
| BROOKINGS-SIOUX FALLS | 515 | 50 | 85.7 | 83.1 | 2.6 | | 8 | 2 | .21 | .53 | 16.9 | 15 |
| CASPER-CODY | 501 | 170 | 267.6 | 255.9 | 11.7 | | 8 | 3 | .83 | .57 | 27.3 | 29 |
| CASPER-WORLAND | 503 | 122 | 147.0 | 135.2 | 11.8 | | 8 | 2 | .41 | .54 | 17.4 | 25 |
| DENVER-GRAND ISLAND | 504 | 356 | 864.7 | 835.2 | 29.5 | | 15 | 3 | 1.28 | .59 | 53.3 | 48 |
| DENVER-HASTINGS | 505 | 346 | 197.8 | 290.2 | -92.4 | .47 | 8 | 2 | 1.05 | .42 | 13.3 | 44 |
| DENVER-LARAMIE | 502 | 115 | 272.4 | 200.5 | 71.9 | | 8 | 3 | .59 | .65 | 31.0 | 26 |
| DENVER-NORTH PLATTE | 506 | 240 | 589.1 | 598.3 | -9.2 | .02 | 15 | 3 | .89 | .55 | 49.8 | 35 |
| DENVER-RIVERTON | 507 | 294 | 381.3 | 390.9 | -9.6 | .03 | 8 | 3 | 1.35 | .59 | 28.2 | 40 |
| DENVER-SCOTTSBLUFF | 508 | 160 | 358.0 | 292.1 | 65.9 | | 15 | 2 | .42 | .55 | 33.1 | 32 |
| GRAND ISLAND-OMAHA | 510 | 128 | 464.0 | 377.6 | 86.4 | | 15 | 3 | .52 | .59 | 52.8 | 26 |
| GREAT FALLS-HAVRE | 509 | 107 | 46.5 | 114.8 | -68.2 | 1.47 | 8 | 2 | .37 | .25 | 8.1 | 17 |
| GREAT FALLS-KALISPELL | 523 | 139 | 163.1 | 255.7 | -92.6 | .57 | 15 | 2 | .37 | .42 | 25.4 | 19 |
| HASTINGS-LINCOLN | 511 | 92 | 218.8 | 170.3 | 48.5 | | 8 | 3 | .49 | .54 | 25.9 | 25 |
| HASTINGS-OMAHA | 529 | 141 | 208.9 | 152.4 | 56.5 | | 8 | 2 | .47 | .64 | 20.6 | 30 |
| HURON-SIOUX FALLS | 516 | 79 | 153.2 | 107.5 | 45.6 | | 8 | 2 | .29 | .64 | 20.6 | 22 |
| KALISPELL-SPOKANE | 524 | 167 | 1372.5 | 919.7 | 452.8 | | 15 | 6 | 1.31 | .63 | 112.8 | 36 |
| MITCHELL-SIOUX FALLS | 517 | 58 | 119.9 | 91.5 | 28.4 | | 8 | 2 | .23 | .62 | 19.7 | 18 |
| NORTH PLATTE-OMAHA | 512 | 250 | 559.7 | 613.4 | -53.7 | .10 | 15 | 3 | .93 | .51 | 46.0 | 36 |
| NORFOLK-OMAHA | 518 | 102 | 238.5 | 184.7 | 53.8 | | 8 | 3 | .54 | .61 | 29.4 | 24 |
| NORFOLK-SIOUX FALLS | 519 | 116 | 94.0 | 127.2 | -33.3 | .35 | 8 | 2 | .40 | .43 | 13.9 | 20 |
| OMAHA-SCOTTSBLUFF | 513 | 401 | 228.1 | 304.3 | -76.1 | .33 | 15 | 1 | .47 | .50 | 15.0 | 45 |
| OMAHA-YANKTON | 520 | 135 | 116.6 | 142.0 | -25.4 | .22 | 8 | 2 | .45 | .47 | 15.0 | 23 |
| RIVERTON-SALT LAKE CITY | 527 | 240 | 194.0 | 218.7 | -24.7 | .13 | 8 | 2 | .75 | .51 | 16.4 | 35 |
| ROCK SPRINGS-SALT LAKE CITY | 528 | 161 | 392.6 | 328.1 | 64.5 | | 8 | 4 | 1.05 | .57 | 36.3 | 32 |
| SIOUX FALLS-WATERTOWN | 521 | 78 | 108.9 | 104.1 | 4.8 | | 8 | 2 | .29 | .56 | 17.9 | 18 |
| SIOUX FALLS-YANKTON | 522 | 48 | 102.3 | 82.5 | 19.8 | | 8 | 2 | .20 | .56 | 17.8 | 17 |

## OLD WEST ROUTE ANALYSIS OUTPUT FORMAT DESCRIPTION

## (MULTI-STOP ROUTES)

The multi-stop computer outputs are designed to provide visibility into the key characteristics of each route segment. It includes an origin and destination section identifying the city-pairs involved in the route, the two-way daily air passengers between each city-pair, the airway distance in statute miles for each segment, and a one-way fare in dollars. In some cases, a community is involved in more than one route (e.g. Norfolk, Nebraska, to Omaha). The total demand from Norfolk to Omaha is thus the sum of the non-stop route demand plus the Norfolk-Omaha segment demand of the multi-stop route.

The segment data section describes each flight segment in terms of on-board passengers and each segment's load factor.

The route data section summarizes, on a route basis, the annual revenue, direct and indirect operating costs, and resultant profit or loss. It also includes the number of hours per day the aircraft is operating (block time), the number of daily round trips, the recommended aircraft size, the number of aircraft required for the route based upon a desired 2500 hours yearly utilization, the average route load factor, and, where routes are unprofitable, a subsidy or loss ratio (loss or required subsidy divided by the revenue).

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                    ROUTE 401: ALLIANCE-SIDNEY-DENVER


           ORIGIN AND DESTINATION                           ROUTE DATA

                             2-WAY    DISTANCE   ONE-WAY   ANNUAL
         CITY PAIR        DAILY PASS.  (S. MI.)   FARE
                              (1)        (2)                 REVENUE (000)       158.8

ALLIANCE-SIDNEY                .0         65        .00      OPER. COST(000)     223.9

SIDNEY-DENVER                 6.0        136      27.00      PROFIT/LOSS(000)    ¯65.1

ALLIANCE-DENVER              11.4                 27.00    BLOCK_TIME(DAILY HR)    4.8

                                                           FREQUENCY(DRT)            2
                    SEGMENT DATA
                                                           AIRCRAFT_SIZE             8

         SEGMENT            ON-BOARD PASS.   LOAD FACTOR   NO_OF_AIRCRAFT(3)       .71

                                                           AVG_LOAD_FACTOR         .48
ALLIANCE-SIDNEY                 11.4             .36
                                                           LOSS_RATIO             .410
SIDNEY-DENVER                   17.4             .54


   (1) ON THIS ROUTE
   (2) AIRWAY DISTANCE
   (3) BASED ON 2500 HR YEARLY
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                   ROUTE 402: BILLINGS-CODY-JACKSON


           ORIGIN AND DESTINATION                             ROUTE DATA

                          2-WAY   DISTANCE   ONE-WAY    ANNUAL
      CITY PAIR        DAILY PASS.  (S. MI.)   FARE
                          (1)        (2)                  REVENUE (000)        130.9

BILLINGS-CODY             3.9         84      22.00       OPER. COST(000)      213.6

CODY-JACKSON              2.6        106      24.00       PROFIT/LOSS(000)     ¯82.6

BILLINGS-JACKSON          9.2                 26.00     BLOCK TIME(DAILY HR)    4.6

                                                        FREQUENCY(DRT)            2
                SEGMENT DATA
                                                        AIRCRAFT SIZE             8

      SEGMENT            ON-BOARD PASS.   LOAD FACTOR   NO OF AIRCRAFT(3)       .68

                                                        AVG LOAD FACTOR         .39
BILLINGS-CODY                13.1            .41
                                                        LOSS RATIO             .631
CODY-JACKSON                 11.8            .37


  (1) ON THIS ROUTE
  (2) AIRWAY DISTANCE
  (3) BASED ON 2500 HR YEARLY
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                    ROUTE 403: BILLINGS-LEWISTON-GREAT FALLS


              ORIGIN AND DESTINATION                            ROUTE DATA


                             2-WAY   DISTANCE   ONE-WAY    ANNUAL
          CITY FAIR       DAILY PASS.  (S. MI.)   FARE
                              (1)        (2)                 REVENUE (000)        83.0

BILLINGS-LEWISTON             8.1        101      19.00      OPER. COST(000)     210.4

LEWISTON-GREAT FALLS          5.1         90      18.00      PROFIT/LOSS(000)   -127.3

BILLINGS-GREAT FALLS           .0                   .00    BLOCK_TIME(DAILY HR)    4.6

                                                           FREQUENCY(DRT)            2
                    SEGMENT DATA
                                                           AIRCRAFT_SIZE             8

           SEGMENT             ON-BOARD PASS.  LOAD FACTOR  NO_OF_AIRCRAFT(3)      .68

                                                           AVG_LOAD_FACTOR         .21
BILLINGS-LEWISTON                   8.1            .25
                                                           LOSS_RATIO            1.533
LEWISTON-GREAT FALLS                5.1            .16


  (1) ON THIS ROUTE
  (2) AIRWAY DISTANCE
  (3) BASED ON 2500 HR YEARLY
```

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                    ROUTE 404: BILLINGS-MILES CITY-GLENDIVE


                 ORIGIN AND DESTINATION                           ROUTE DATA

                             2-WAY    DISTANCE   ONE-WAY     ANNUAL
       CITY PAIR          DAILY PASS.  (S. MI.)    FARE
                              (1)        (2)                   REVENUE (000)       127.1

BILLINGS-MILES CITY           2.0        134       26.00       OPER. COST(000)     223.7

MILES CITY-GLENDIVE            .0         74         .00       PROFIT/LOSS(000)    ¯96.7

BILLINGS-GLENDIVE            10.8                  30.00     BLOCK_TIME(DAILY HR)    5.0

                                                             FREQUENCY(DRT)            2
                        SEGMENT DATA
                                                             AIRCRAFT_SIZE             8

        SEGMENT             ON-BOARD PASS.   LOAD FACTOR     NO_OF_AIRCRAFT(3)       .73

                                                             AVG_LOAD_FACTOR         .38
BILLINGS-MILES CITY            12.8           .40
                                                             LOSS_RATIO             .761
MILES CITY-GLENDIVE            10.8           .34


  (1) ON THIS ROUTE
  (2) AIRWAY DISTANCE
  (3) BASED ON 2500 HR YEARLY
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                         ROUTE 405: BILLINGS-SIDNEY-WILLISTON


                ORIGIN AND DESTINATION                                   ROUTE DATA


                             2-WAY    DISTANCE   ONE-WAY    ANNUAL
         CITY PAIR        DAILY PASS.  (S. MI.)    FARE
                              (1)        (2)                  REVENUE (000)       226.0

BILLINGS-SIDNEY               8.3        265       38.00      OPER. COST(000)     299.6

SIDNEY-WILLISTON               .0         41         .00      PROFIT/LOSS(000)    -73.5

BILLINGS-WILLISTON            9.3                  38.00    BLOCK TIME(DAILY HR)    6.9

                                                            FREQUENCY(DRT)            2
                   SEGMENT DATA
                                                            AIRCRAFT SIZE             8

         SEGMENT             ON-BOARD PASS.   LOAD FACTOR   NO OF AIRCRAFT(3)      1.01

                                                            AVG LOAD FACTOR         .52
BILLINGS-SIDNEY                  17.6            .55
                                                            LOSS RATIO             .325
SIDNEY-WILLISTON                  9.3            .29


  (1) ON THIS ROUTE
  (2) AIRWAY DISTANCE
  (3) BASED ON 2500 HR YEARLY
```

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                        ROUTE 406: BILLINGS-WORLAND-RIVERTON


                ORIGIN AND DESTINATION                             ROUTE DATA

                              2-WAY    DISTANCE   ONE-WAY    ANNUAL
        CITY PAIR          DAILY PASS.  (S. MI.)   FARE
                               (1)        (2)                  REVENUE (000)        99.6

BILLINGS-WORLAND               3.5        130      20.00       OPER. COST(000)     216.1

WORLAND-RIVERTON                .1         68      21.00       PROFIT/LOSS(000)   ¯116.5

BILLINGS-RIVERTON              8.9                 25.00     BLOCK_TIME(DAILY HR)    4.8

                                                             FREQUENCY(DRT)            2
                     SEGMENT DATA
                                                             AIRCRAFT_SIZE             8

        SEGMENT              ON-BOARD PASS.   LOAD FACTOR    NO_OF_AIRCRAFT(3)       .70

                                                             AVG_LOAD_FACTOR         .35
BILLINGS-WORLAND                 12.4            .39
                                                             LOSS_RATIO            1.170
WORLAND-RIVERTON                  9.0            .28


  (1) ON THIS ROUTE
  (2) AIRWAY DISTANCE
  (3) BASED ON 2500 HR YEARLY
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               ROUTE 407: BISMARCK-ABERDEEN-SIOUX FALLS


              ORIGIN AND DESTINATION                         ROUTE DATA

                               2-WAY    DISTANCE   ONE-WAY   ANNUAL
         CITY PAIR          DAILY PASS.  (S. MI.)   FARE
                               (1)         (2)                  REVENUE (000)        565.3

BISMARCK-ABERDEEN              16.3        148      23.00      OPER. COST(000)      539.3

ABERDEEN-SIOUX FALLS           15.0        145      32.00      PROFIT/LOSS(000)      26.0

BISMARCK-SIOUX FALLS           22.1                 37.00    BLOCK_TIME(DAILY HR)    5.3

                                                             FREQUENCY(DRT)            2
                    SEGMENT DATA
                                                             AIRCRAFT_SIZE            15

           SEGMENT              ON-BOARD PASS.   LOAD FACTOR  NO_OF_AIRCRAFT(3)       .78

                                                             AVG_LOAD_FACTOR         .63
BISMARCK-ABERDEEN                    38.4           .64
                                                             LOSS_RATIO
ABERDEEN-SIOUX FALLS                 37.1           .62


   (1) ON THIS ROUTE
   (2) AIRWAY DISTANCE
   (3) BASED ON 2500 HR YEARLY
```

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                    ROUTE 408: CHADRON-SCOTTSBLUFF-DENVER


              ORIGIN AND DESTINATION                            ROUTE DATA

                                 2-WAY   DISTANCE   ONE-WAY    ANNUAL
        CITY PAIR             DAILY PASS.  (S. MI.)   FARE
                                  (1)        (2)                 REVENUE (000)        385.8

CHADRON-SCOTTSBLUFF               .0        68        .00        OPER. COST(000)      431.3

SCOTTSBLUFF-DENVER              26.0       160      33.00        PROFIT/LOSS(000)     -45.5

CHADRON-DENVER                   8.1                35.00      BLOCK_TIME(DAILY HR)    4.4

                                                               FREQUENCY(DRT)            2
                  SEGMENT DATA
                                                               AIRCRAFT_SIZE            15

        SEGMENT              ON-BOARD PASS.   LOAD FACTOR      NO_OF_AIRCRAFT(3)       .64

                                                               AVG_LOAD_FACTOR         .44

CHADRON-SCOTTSBLUFF                 8.1           .13          LOSS_RATIO             .118

SCOTTSBLUFF-DENVER                 34.1           .57


  (1) ON THIS ROUTE
  (2) AIRWAY DISTANCE
  (3) BASED ON 2500 HR YEARLY
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                    ROUTE #10: DENVER-MCCOOK-KEARNEY


           ORIGIN AND DESTINATION                        ROUTE DATA

                          2-WAY     DISTANCE   ONE-WAY   ANNUAL
      CITY PAIR        DAILY PASS.  (S. MI.)    FARE
                           (1)         (2)                 REVENUE (000)        389.7

DENVER-MCCOOK             13.0        224       37.00      OPER. COST(000)      458.4

MCCOOK-KEARNEY              .0         88         .00      PROFIT/LOSS(000)     ¯68.7

DENVER-KEARNEY            16.0                  42.00    BLOCK TIME(DAILY HR)   10.5

                                                         FREQUENCY(ORT)            3
                  SEGMENT DATA
                                                         AIRCRAFT SIZE             8

       SEGMENT           ON-BOARD PASS.   LOAD FACTOR    NO OF AIRCRAFT(3)      1.53

                                                         AVG LOAD FACTOR         .53
DENVER-MCCOOK                 29.0            .60
                                                         LOSS RATIO             .176
MCCOOK-KEARNEY                16.0            .33


  (1) ON THIS ROUTE
  (2) AIRWAY DISTANCE
  (3) BASED ON 2500 HR YEARLY
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                              ROUTE 411: GRAND FORKS-FARGO-WATERTOWN


                         ORIGIN AND DESTINATION                                ROUTE DATA


                                         2-WAY    DISTANCE    ONE-WAY     ANNUAL
            CITY PAIR              DAILY PASS.  (S. MI.)    FARE
                                          (1)        (2)                    REVENUE (000)        458.3

     GRAND FORKS-FARGO                   26.7         75       25.00        OPER. COST(000)      448.1

     FARGO-WATERTOWN                      5.2        118       20.00        PROFIT/LOSS(000)      10.3

     GRAND FORKS-WATERTOWN               16.7                  35.00      BLOCK TIME(DAILY HR)    9.4

                                                                          FREQUENCY(DRT)            4
                              SEGMENT DATA
                                                                          AIRCRAFT SIZE             8

             SEGMENT                  ON-BOARD PASS.   LOAD FACTOR       NO OF AIRCRAFT(3)       1.37

                                                                          AVG LOAD FACTOR          .47
     GRAND FORKS-FARGO                      43.4            .68
                                                                          LOSS RATIO
     FARGO-WATERTOWN                        21.9            .34


       (1) ON THIS ROUTE
       (2) AIRWAY DISTANCE
       (3) BASED ON 2500 HR YEARLY
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                         ROUTE 412: GREAT FALLS-GLASGOW-WOLF POINT


                   ORIGIN AND DESTINATION                             ROUTE DATA


                                 2-WAY    DISTANCE   ONE-WAY    ANNUAL
            CITY PAIR         DAILY PASS.  (S. MI.)   FARE
                                  (1)        (2)                 REVENUE (000)        193.2

GREAT FALLS-GLASGOW              10.0        253      33.00      OPER. COST(000)      295.5

GLASGOW-WOLF POINT                 .0         49        .00      PROFIT/LOSS(000)    -102.4

GREAT FALLS-WOLF POINT            6.9                 35.00     BLOCK TIME(DAILY HR)    6.8

                                                                FREQUENCY(DRT)            2
                      SEGMENT DATA
                                                                AIRCRAFT SIZE             8

            SEGMENT              ON-BOARD PASS.   LOAD FACTOR   NO OF AIRCRAFT(3)       .99

                                                                AVG LOAD FACTOR         .48
GREAT FALLS-GLASGOW                   16.9            .53
                                                                LOSS RATIO             .530
GLASGOW-WOLF POINT                     6.9            .22


  (1) ON THIS ROUTE
  (2) AIRWAY DISTANCE
  (3) BASED ON 2500 HR YEARLY
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                         ROUTE 413: KEARNEY-COLUMBUS-OMAHA


                ORIGIN AND DESTINATION                           ROUTE DATA

                              2-WAY    DISTANCE   ONE-WAY    ANNUAL
          CITY PAIR        DAILY PASS.  (S. MI.)    FARE
                               (1)        (2)                 REVENUE (000)      147.2

KEARNEY-COLUMBUS                .0        99         .00      OPER. COST(000)    209.7

COLUMBUS-OMAHA                 7.7        81       18.00      PROFIT/LOSS(000)   ¯62.5

KEARNEY-OMAHA                 11.0                 27.00     BLOCK TIME(DAILY HR)  4.4

                                                             FREQUENCY(DRT)          2
                     SEGMENT DATA
                                                             AIRCRAFT SIZE           8

          SEGMENT             ON-BOARD PASS.   LOAD FACTOR   NO OF AIRCRAFT(3)     .65

                                                             AVG LOAD FACTOR       .45
KEARNEY-COLUMBUS                  11.0            .34
                                                             LOSS RATIO           .424
COLUMBUS-OMAHA                    18.7            .58


   (1) ON THIS ROUTE
   (2) AIRWAY DISTANCE
   (3) BASED ON 2500 HR YEARLY
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                    ROUTE 414: MCCOOK-HASTINGS-OMAHA


          ORIGIN AND DESTINATION                                        ROUTE DATA

                            2-WAY    DISTANCE   ONE-WAY    ANNUAL
      CITY PAIR          DAILY PASS.  (S. MI.)   FARE
                              (1)        (2)                REVENUE (000)        199.1

MCCOOK-HASTINGS               .0        117        .00      OPER. COST(000)      266.9

HASTINGS-OMAHA              14.0        141      27.00      PROFIT/LOSS(000)     ¯67.7

MCCOOK-OMAHA                 6.6                 32.00    BLOCK_TIME(DAILY HR)    6.0

                                                          FREQUENCY(DRT)            2
                    SEGMENT DATA
                                                          AIRCRAFT_SIZE             8

      SEGMENT              ON-BOARD PASS.   LOAD FACTOR   NO_OF_AIRCRAFT(3)       .87

                                                          AVG_LOAD_FACTOR         .45
MCCOOK-HASTINGS                 6.6            .21
                                                          LOSS_RATIO             .340
HASTINGS-OMAHA                 20.6            .64


   (1) ON THIS ROUTE
   (2) AIRWAY DISTANCE
   (3) BASED ON 2500 HR YEARLY
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                    ROUTE 415: MINOT-BISMARCK-RAPID CITY


           ORIGIN AND DESTINATION                          ROUTE DATA

                              2-WAY   DISTANCE   ONE-WAY    ANNUAL
       CITY PAIR          DAILY PASS.  (S. MI.)   FARE
                              (1)        (2)                  REVENUE (000)       537.9

MINOT-BISMARCK                17.0       106      24.00       OPER. COST(000)     493.4

BISMARCK-RAPID CITY           18.1       219      34.00       PROFIT/LOSS(000)     44.4

MINOT-RAPID CITY              14.2                40.00     BLOCK_TIME(DAILY HR)   10.9

                                                            FREQUENCY(DRT)          3
                    SEGMENT DATA
                                                            AIRCRAFT_SIZE           8

          SEGMENT            ON-BOARD PASS.   LOAD FACTOR   NO_OF_AIRCRAFT(3)     1.59

                                                            AVG_LOAD_FACTOR        .67
MINOT-BISMARCK                  31.2              .65
                                                            LOSS_RATIO
BISMARCK-RAPID CITY             32.3              .67


  (1) ON THIS ROUTE
  (2) AIRWAY DISTANCE
  (3) BASED ON 2500 HR YEARLY
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                                                                                    NETWORK

                          ROUTE 416: MINOT-WILLISTON-WOLF POINT

                     ORIGIN AND DESTINATION                              ROUTE DATA

                               2-WAY    DISTANCE   ONE-WAY    ANNUAL
          CITY PAIR         DAILY PASS.  (S. MI.)   FARE
                                (1)        (2)                  REVENUE (000)        108.5

MINOT-WILLISTON                10.8       109      20.00        OPER. COST(000)      217.9

WILLISTON-WOLF POINT             .0        89        .00        PROFIT/LOSS(000)    -109.4

MINOT-WOLF POINT                4.2                25.00      BLOCK TIME(DAILY HR)     4.8

                                                              FREQUENCY(DRT)             2
                          SEGMENT DATA
                                                              AIRCRAFT SIZE              8

           SEGMENT             ON-BOARD PASS.   LOAD FACTOR   NO OF AIRCRAFT(3)        .70

                                                              AVG LOAD FACTOR          .32
MINOT-WILLISTON                     15.0            .47
                                                              LOSS RATIO             1.009
WILLISTON-WOLF POINT                 4.2            .13


  (1) ON THIS ROUTE
  (2) AIRWAY DISTANCE
  (3) BASED ON 2500 HR YEARLY
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                          ROUTE 418: LARAMIE-CASPER-RIVERTON


                ORIGIN AND DESTINATION                              ROUTE DATA

                                 2-WAY   DISTANCE   ONE-WAY   ANNUAL
         CITY PAIR           DAILY PASS.  (S. MI.)   FARE
                                 (1)        (2)                 REVENUE (000)         154.3

LARAMIE-CASPER                   8.1        117      22.00      OPER. COST(000)       236.9

CASPER-RIVERTON                  9.6        101      22.00      PROFIT/LOSS(000)      ¯82.5

LARAMIE-RIVERTON                 2.4                 28.00    BLOCK TIME(DAILY HR)     5.2

                                                              FREQUENCY(DRT)             2
                     SEGMENT DATA
                                                              AIRCRAFT SIZE              8

         SEGMENT               ON-BOARD PASS.   LOAD FACTOR   NO OF AIRCRAFT(3)        .76

                                                              AVG LOAD FACTOR          .35
LARAMIE-CASPER                    10.5             .33
                                                              LOSS RATIO              .535
CASPER-RIVERTON                   12.0             .38



  (1) ON THIS ROUTE
  (2) AIRWAY DISTANCE
  (3) BASED ON 2500 HR YEARLY
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## Route 419: Omaha - Lincoln - N. Platte - Scottsbluff

### Origin & Destination

| | Pass. | Distance | Fare |
|---|---|---|---|
| Lincoln - Omaha | - | 55 | - |
| Lincoln - N. Platte | 4.0 | 207 | 37 |
| N. Platte - Scottsbluff | 1.5 | 159 | 29 |
| N. Platte - Omaha | 4.4 | - | 34 |
| Lincoln - Scottsbluff | 7.0 | - | 50 |
| Omaha - Scottsbluff | 6.2 | - | 49 |

### Route Data

| Annual | |
|---|---|
| Revenue (000) | 336.2 |
| Oper. Cost (000) | 420.3 |
| Profit/Loss (000) | -84.1 |
| Block Time (Hr) | 9.6 |
| Frequency (DRT) | 2 |
| Aircraft Size | 8 |
| No. of Aircraft | 1.4 |
| Ave. Load Factor | 55% |
| Loss Ratio | .25 |

### Segment Data

| | On-Board Pass. | Load Factors |
|---|---|---|
| Omaha - Lincoln | 10.6 | 33% |
| Lincoln - N. Platte | 21.6 | 67% |
| N. Platte - Scottsbluff | 14.7 | 46% |

- FINANCIAL STABILITY
- EXPERIENCE AND QUALIFICATIONS
- PROPOSED PROMOTIONAL PROGRAMS
- PROPOSED OPERATING PRACTICES

# APPENDIX 5

# OPERATOR SELECTION CONSIDERATIONS

A key aspect of successfully implementing commuter air service within any state or region will be the selection of properly qualified operators. There are a number of requirements imposed both by the state and the federal government that must be met by operators in order to institute service legally. Additionally, the operator's proposed operating practices can be of considerable value in evaluating a candidate operator and should be considered. The primary elements related to operator selection include the following:

- Financial stability
- Experience and qualifications
- Proposed promotional programs
- Proposed operating practices

Each of these elements is discussed in the following pages.

- Financial Stability

Financial stability considerations must principally include an operator's ability to withstand initial start-up costs, reduced revenue during the first year because of demand build-up in new markets, and, subsequently, demand variations because of seasonal changes in passenger travel habits.

Operator start-up costs are discussed in the "Commuter Aircraft and Airline Economics" section in the main body of the report. Start-up costs are identified for an existing commuter air carrier extending his route network, as well as a new airline being formed to provide service for the first time. Such one-time costs can approximate $25,000 for a minimum two-station route network and must be specifically considered in evaluating financial stability.

Another major factor in financial stability will be the ability to withstand reduced demand during the first year as the service is becoming known to the community. An average demand level is extremely difficult to predict because of the large number of variables present. However, in reviewing the composite experience of commuter operators operating in the Midwest and West, mature demand was usually reached in about one year with an average of approximately 75 percent of the ultimate mature demand level realized that first year. The actual time to achieve a mature market demand can vary considerably, however, and may range from a few months to two years.

Consideration must also be given to typical demand build-up cycles. When new service is first instituted in a community, the attendant publicity will usually result in a high build-up rate for perhaps one or two months. However, as the newness wears off, there is usually a dip in demand that would then increase at a much slower pace. Variations after mature demand has been reached must also be specifically considered including daily, weekly, and seasonal changes.

Many operators, without the monetary reserve to withstand these reduced revenue periods, find themselves attempting to reduce costs on the very elements they should be emphasizing. Usually, advertising budgets are reduced, service frequencies are reduced, and, in some cases, maintenance practices are adjusted to reduce costs. Thus, a downward spiral is created, which further reduces revenue because of less public visibility of the airline, fewer flights to choose from, and possibly less reliability of service. In general, extreme care must be taken to ensure that an operator will be able to withstand not only the first-year costs involved, but also demand variations after mature demand levels have been reached.

- Experience and Qualifications

(1) Federal Requirements

Required experience and qualifications are difficult parameters to describe quantitatively. In the regulatory sense, each operator must have an FAA Air Taxi/Commercial Operators (ATCO) certificate and must fully comply with Federal Aviation Regulation (FAR) Part 135, "Air Taxi Operators and Commercial Operators of Small Aircraft." This part identifies operator requirements related to organizational and business practices, primary aircraft operating rules, crewmember qualifications, and required aircraft and equipment features. Additionally, a commuter operator is required to register with the CAB under their Economic Regulation Part 298, which provides for exemptions to Title IV of the Federal Aviation Act of 1958 as long as aircraft of 30-passenger capacity or less are used (7500-pound maximum payload). Under the rules of this Part 298 exemption, commuter operators are required to report traffic statistics quarterly as well as carry certain insurance minimums.

FAA records provide a good source of information regarding past performance of prospective operators. These records include the following:

- Application for ATCO Certificate
  - Type of business organization (individual, partnership, corporation, etc.)
  - Names and addresses of principals in the company
  - Names of operations manager and maintenance supervisor
  - List of aircraft available for use with ownership and equipment classes (IFR, VFR, Day, Night)

- ATCO operations specifications (including current amendments)
    - Provides authorized aircraft categories, classes, and conditions (e.g., multi-engine, helicopter, VFR, IFR, Day, and Night)
    - Authorized area of operation (e.g., state(s) and foreign countries)
    - Special requirements (e.g., records required and autopilot authorization)
- File of airman Proficiency/Qualification Check (FAA Form 8410-1) for each currently employed pilot
- Certificate of authority to take weather observations
- Operator's manual(s) for aircraft currently in use
- Pilot training curriculum
- Aircraft Daily Record forms (preferrably copies of those filled out during actual operations)
- Approved Aircraft Inspection Program
- Weight and Balance Control procedures

Also, a summary of all accidents and incidents occurring to company-owned aircraft or involving current company employees (at least five years) could be requested from the operator and can be readily verified from federal files.

### (2) State Requirements

Each of the states within the Old West Region has state-level requirements pertaining to an operator serving two or more points within each state. These rules and regulations are discussed in the "Commuter System Implementation" section in the main body of the report.

- Proposed Promotional Programs

Probably one of the more important qualitative evaluation factors of a potential commuter operator is his willingness (and identified plans) to enhance community relations and to solicit support for his service. Without community support and the community leaders working with the travelling segments of both their governmental and business structure, demand levels may be reduced below economically viable levels. Community relations should not be limited to occasional advertising or Chamber of Commerce speeches, but should include aggressive promotional activities to solicit cargo contracts as well as special commercial service contracts, develop working relationships with travel agents (who usually turn out to be the most successful promoter a commuter operator can find), provide fare discount packages and shoppers' specials to enhance off-peak travel, and develop other such promotional programs. Additionally, operators usually have a large percentage of passengers who desire to inter-line with a certificated air carrier for another portion of their trip. Appropriate inter-line agreements with certificated carriers pertaining to through ticketing, joint fares, joint use of reservation systems, and joint use of handling equipment, are extremely important in assuring the economic success of the service.

- Proposed Operating Practices

Probably the most difficult and continuing challenge facing the commuter operator is to convince the public that his service is an airline. In addition to providing safe and reliable service, he must provide a thoroughly professional operation. Such factors as uniforms for pilots and ground personnel, full-time help at even remote stations, equipment carrying the airline logo, well-publicized schedules (in not only pamphlet form but also in the Official Airline Guide), and an active public education program are all considered essential. As most commuter operators utilize small twin-engine aircraft, there is usually an element of the public that will equate safety of flight directly to size of aircraft. An operator thus faces the need to

- Appropriately educate the public with the inherent safety of even small aircraft
- Illustrate the benefits of flying at lower altitude where scenery is still visible
- Most importantly, demonstrate the reliability and convenience of the service through incident-free, on-time performance.

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# GLOSSARY

| | |
|---|---|
| ADAP | Airport Development Aid Program |
| ADF | Automatic Direction Finder |
| Air Demand | The total number of persons traveling between two communities by air |
| ATC | Air Traffic Control |
| BT | Block Time: The total time it takes an aircraft to fly from one airport to another airport, including the time for taxi, take-off, climb, cruise, descend, and land |
| CAB | Civil Aeronautics Board |
| CY | Calendar Year |
| Daily Round Trip | A trip from one community to another and return the same day |
| DME | Distance Measuring Equipment |
| DOC | Direct Operating Cost: aircraft operating costs for the flight crew, fuel, oil, insurance, maintenance, and aircraft depreciation; usually expressed per hour of flight time |
| ELT | Emergency Locator Transmitter |
| FAA | Federal Aviation Administration |
| FAR | Federal Aviation Regulation |
| FY | Fiscal Year |
| HIRL | High-Intensity Runway Lights |
| IFR | Instrument Flight Rules |
| ILS | Instrument Landing System |
| Inter-Line Trip | A trip that originates in one city of a city-pair and transfers to a different airline in the second city to continue the journey to a final destination in a third city |

| | |
|---|---|
| IOC | Indirect Operating Cost: Indirect airline costs related to support and administrative operations, including passenger services, aircraft and traffic servicing, reservations and ticket sales, sales and advertising, general and administrative, and depreciation of ground property |
| LIRL | Low-Intensity Runway Lights |
| Load Factor | The number of passengers on an aircraft, expressed as a percentage of its total passenger seating capacity (i.e., an aircraft with a 50 percent load factor is half full) |
| Local Trips | A trip that originates in one city and terminates in the other city of a given city-pair |
| MEA | Minimum Enroute Altitude |
| MIRL | Medium-Intensity Runway Lights |
| Modal Split | That portion of the total persons traveling between two communities that will use each available transportation mode. An air modal split is the portion of the total persons traveling that choose air transportation. |
| MSL | Mean Sea Level |
| NDB | Non-Directional Beacon |
| nmi | Nautical mile |
| O&D | Origin and Destination |
| On-Line Trip | A trip that originates in one city of a city-pair, stops in the second city, and then continues the journey to a third destination on the same airline, either in the original plane or transferred to a different plane |
| ROI | Return On Investment: Profit or loss expressed as a percentage of total investment. An average of 12 percent per year is normally considered to be a fair return for an airline investment. |
| smi | Statute mile |
| TOGW | Take-Off Gross Weight |

| | |
|---|---|
| Total Demand | The number of persons traveling between two communities by all available transportation modes; usually expressed in two-way daily person trips |
| TSO | Technical Service Order |
| Two-Way Daily Person Trips | The number of persons traveling between two communities each day (i.e., a person traveling from McCook to Denver and returning the same day represents two daily person trips) |
| VHF | Very High Frequency |
| VOR | VHF Omnidirectional Range |